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ABSTRACT

This handbook provides practical plans for theme-based activities that promote learning through doing. Each activity incorporates a wide range of tasks and skills across multiple content areas that can be modified for students of different abilities and grade levels. The book also illustrates how to make activities more meaningful by including parents, tapping community and Internet resources, and requiring students to engage in structured reflection. The 12 chapters are grouped into sections on basic, intermediate, and advanced performance. The chapters are: (1) "Introduction to Performance Learning"; (2) "Rotting Peels and Cores"; (3) "Sound Bodies for Growing Minds"; (4) "Learning Brains and Music Strains"; (5) "Making Sense of Stories"; (6) "...To Form a More Perfect Classroom"; (7) "Cruising the Cortex: Sightseeing for Smarts"; (8) "Perfectly Proportioned"; (9) "Patterning Neurons to Picture Patterns"; (10) "Half-Life in World Life"; (11) "The Heart-Smart Gourmet"; and (12) "A Special Holiday: AttaGram Day." (Contains 2 tables, 68 figures, and 89 references.) (SLD)

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for the

MULTIPLE INTELLIGENCES CLASSROOM

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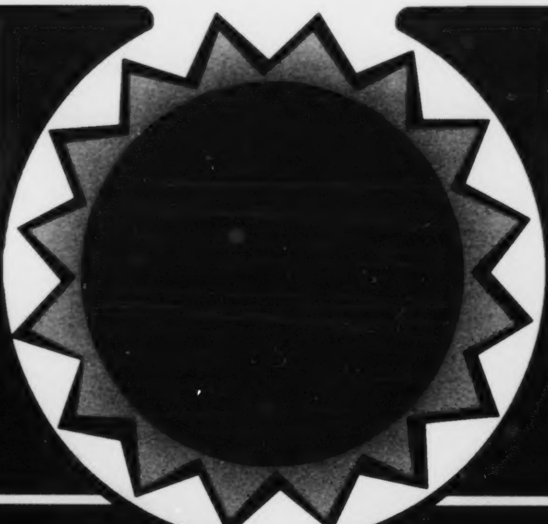

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PERFORMANCE-BASED
LEARNING
for the
MULTIPLE INTELLIGENCES
CLASSROOM

Sally Berman

SkyLight
PROFESSIONAL DEVELOPMENT
Arlington Heights, Illinois

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To my sister

Mary Anne Snyder,

a model performance learner

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So many influences contributed to the shaping of this book. Al, my partner and love, gave me the time, freedom, and encouragement to do these pieces of writing, and understood that time spent looking out the window or snowshoeing on the ice pack is time I need to blow out the mental cobwebs and set off creative sparks. Jean Ward and Barb Lightner at SkyLight cared for the manuscript and guided it through the publication process. Their thoughts, ideas, and expertise added immeasurably to the quality of the final product. As I looked at the fit between the performance learning model and the performance tasks I was creating, I found myself integrating and coordinating research on brain growth and learning from so many different sources, all of whom are cited in the bibliography. Writing this book encouraged me to review work on multiple intelligences, brain growth, and emotional intelligence.

Internet resources are becoming more and more valuable to me as a writer. The individual school districts and states that have their learning standards online gave me valuable insight into the performances that policy makers expect of students in their school systems. I found websites with helpful information about some of the skills and information needed to do every performance task in this book. I live in a remote area, and the Internet gave me the freedom to write in this setting, miles from large research facilities.

Thank you all.

Rationale

Once upon a time, a school staff decided that its highest priority was helping students to become better writers. Students spent much time analyzing sentences to identify parts of speech. They combed through long lists of sentences looking for capitalization and punctuation errors. Exercising their visual skills, students diagrammed sentences to show the relationships of the parts to the whole. Student investigators inspected sentences for subject/verb agreement, dangling participles, and split infinitives. At the end of the school year, students took a multiple-choice test to demonstrate their mastery of writing skills. Test scores were high. The school staff was pleased.

Time passed. The students graduated and moved to new schools and jobs. One by one, they heard, "Your writing is terrible! Where did you go to school? Didn't they teach you anything at that place? You need to take a remedial writing course if you want to be successful with us." The students returned to the school exclaiming, "We thought we were learning to write! But we don't know how to write! We just don't get it! You said you were teaching us how to write!"

The moral: *Performing glues a skill in the brain; he (or she) who performs, learns.*

Introduction

For the past several years, classroom teachers and assessment authorities have extolled the benefits of performance assessment. As students show what they know by doing a performance or task, teachers see more clearly what students have mastered and what learning has eluded them. Good teachers use the results of performance assessments to improve the learning experiences that students encounter in their classrooms. Caring teachers say, "If we expect students to do a task or performance to demonstrate their learning, we need to make learning contextual. We want the learning experiences to align with the assessment techniques."

These teachers construct communities of active learners in their classrooms. They invite students to become partners in improving learning by explaining the learning standards that students are expected to meet, giving students rubrics that describe developmental levels of performance, and showing students how to use the rubrics to evaluate the strengths of their present performances, decide how to improve those performances, and work toward that improvement. In these classrooms, students learn the lifelong skill of kaizen, the use of continual self-assessment, adjustment, and stepwise improvement to achieve high quality learning.

In 1988, Dr. Marian Diamond said that experiential learning is the key to growing the axon-dendrite connections that brains use to process cognitive information. Her studies suggest that student involvement and interaction with materials in the classroom build better brains for learning. In 1991, Renate Nummela Caine and Geoffrey Caine stated that the brain remembers best what it learns in context. Both sets of research point to performance learning as a tool for developing deeper understanding and for enhancing ability to apply knowledge of facts appropriately in a new situation (Gardner 1991).

Performance learning is a curriculum model that produces deep, long-lasting learning and develops expertise in procedural skills.

As You Read This Book

Read the first chapter carefully. It contains the research base for this curriculum model, and it references the work done by many educational and brain physiology experts. The bibliography lists these references and materials as well as others. Readers are encouraged to obtain and read some of these resource materials if they want to acquire useful tips and background for the performance tasks described in chapters 2 through 12.

Browse through the rest of the chapters. Each chapter details a performance learning task that the reader may choose to do as presented or use as a model for performance learning applications of his or her own. Notice that they all use the same basic outline—performance, prompt, vision, standards, coaching context, presentation, and reflection.

Each chapter begins with a brief description of the performance learning task and reasons why the task fits the performance learning model (The Performance). The chapter goes on to describe how the teacher might present the task and provide examples of excellent performance presentations to the students (The Prompt).

In The Vision, each chapter describes how the teacher and students can inspect examples of learning and presentation excellence. These examples of expert practices in learning and presenting will help students self-evaluate and improve the quality of their learning as they work their way through the performance task and the final presentation.

In the section titled The Standards, look at the task development chart. It contains the steps in the performance task, the curriculum standards that align with the task, and a description of the performance development levels from novice to expert.

The Standards also contains the rubric for the performance learning task. This rubric can be used as a final assessment tool. Its more powerful use is for ongoing self-evaluation and performance improvement by students as they work toward the final presentation. Students who know the assessment standards, or criteria, and who have seen examples of excellent performances will demonstrate deeper understanding and more proficient learning.

The section titled The Coaching Context details the actions of students and teacher in the performance learning task. Each chapter concludes with a description of the presentation performance (The Presentation) and suggestions for individual or group reflection (The Reflection).

Readers may use this book to jump-start their imaginations as they decide how students can best learn specific content. Each reader may pick one learning standard that students are expected to meet and ask, "To show that they have learned this, what will I ask students to do? What performance or task will I ask students to demonstrate?" The answer to that question can guide the reader in structuring the classroom experience into a performance learning task. Find applications. Design performance learning tasks that will help students grow better brains for lifelong learning.

Chapter 1

Introduction to Performance Learning

What Is Performance Learning?

Performance learning immerses students in learning facts, skills, and concepts by doing tasks or performances. A teacher or mentor guides the learner as he or she practices and refines a skill. The learner demonstrates proficiency by doing the skill, first in familiar settings and ultimately in new situations. To celebrate success, the student displays skill development in a public performance.

Performance learning is the difference between watching cross-country ski races on television and doing cross-country skiing. The television viewer does not feel the slipperiness of the snow, the glide of the skis, or the interplay among thigh, torso, and arm muscles needed to maintain balance on the trail. The novice skier experiences all of those feelings plus the softness of the snow when he falls and the cold tingling as snowmelt runs down his neck inside his jacket. Focusing on the skill keeps the novice upright on his skis. As he practices and his proficiency improves, his attention shifts to the terrain, the views from the trail, and the birds and other wildlife sharing the territory with him. This performance learner may be on view each time he practices the skill. If he shares the trail with other skiers, they may notice his ongoing improvement and comment about it. The novice and the more experienced skiers share a common, informal set of standards by which they evaluate his performance. Many people who have learned to ski remember the benchmarks that indicate each increase in skill development. Everyone on the trail shares a common vision of the expert churning across the finish line to win the Olympic gold medal.

Learning to ski may be linked to other, broader concepts such as lifelong fitness. The novice skier may prefer exercising in fresh air to working out in a gym, and winter snow or ice may make walking or biking difficult. When faced with these weather realities, the novice may decide to learn to ski to expand his repertoire of outdoor activities. His commitment to learn-

ing to ski demonstrates his understanding of the impact of exercise on aerobic fitness, cholesterol levels, and overall strength and agility. By choosing to learn a new skill to apply these ideas, the novice is demonstrating *understanding* as Gardner (1991) defines it. He is applying his knowledge of the facts appropriately in a new situation.

When Is Performance Learning the Most Appropriate Model for the Learning Task?

Sometimes, the most effective learning results from doing a task or practicing a performance that applies important facts or concepts. Renate Nummela Caine and Geoffrey Caine (1991) state that the brain remembers best what it learns in the context of ordinary, everyday experiences. The novice skier remembers the fitness concepts that he has learned in the context of physical exercise. To learn and remember how to change the speed of a chemical reaction, a science student could manage a compost pile. Ideas and concepts that are embedded in this kind of natural, spatial learning experience are the ones that stick to the brain.

Caine and Caine also state that the brain processes parts and wholes simultaneously. The science student's brain remembers facts about factors that affect reaction speed because the brain is focused on the details of temperature, moisture, added ingredients, scrap size, and the whole picture of turning food scraps and lawn clippings into compost. The compost pile provides a context within which the details and concepts are more lastingly remembered.

In deciding when to use performance learning, teachers may want to ask themselves these questions:

- Are these ideas or concepts embedded in a particular task or performance?
- What skills are associated with learning these ideas or concepts?
- What learning do my students need to be able to demonstrate to graduate to the next level of education?

Inspecting school district or state standards will help teachers answer the last question. Information about standards can be found on the Internet at <http://www.putwest.boces.org/Standards.html>. This site, maintained by the Putnam Valley Central Schools, is an electronic repository of information about national, state, and local standards as well as those of other countries and standards by subject area.

Most states have published criteria for graduation: standards and benchmarks that describe and define the learning that students must exhibit in order to graduate to the next learning level (i.e., elementary school, middle school, high school, post high school, or lifelong learner). These standards and benchmarks often specify that students will demonstrate their learning by doing a performance assessment. Performance learning provides students with the skills they will be asked to demonstrate on performance assessments.

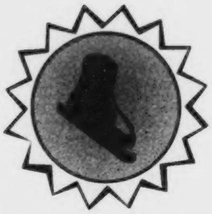
Why Is Performance Learning Effective? How Does Performance Learning Help Students Become Quality Learners?

As teacher and student assess student performance, they begin by focusing on what the student can do and how his performance has improved since the previous assessment. The student experiences positive emotions about his task or skill development, and this enhances further learning and improvement in important ways. Ornstein and Sobel (1987) say that people want to repeat pleasant experiences and avoid unpleasant ones. O'Keefe and Nadel (1978) conclude that positive emotions create the conditions for the brain to form better cognitive maps. The student will be able to remember his performance more clearly, repeat it more effortlessly, and remember associated ideas and concepts more accurately when he remembers learning as a pleasant experience.

At the beginning of the task, the teacher, as a performance learning coach, and the student will look at the stages of skill development and the vision of the final level of achievement. The teacher will encourage the learner to focus on improvement and step-by-step skill development. This focus on gradual improvement is especially important for young children who often are not aware of the natural stages of skill development. Depending on the children's ages, the teacher can help them understand the concept of developmental stages by asking if they remember learning another skill, for example, fastening shoes or coloring inside the lines, and the teacher and students will discuss the development stages of that performance.

To guide the learner through development of the new performance, the teacher will give him a performance checklist or a performance rubric that details the performance criteria for each developmental level. The coach—who can be either the teacher or a fellow student—will encourage the learner to continuously self-evaluate his performance, determine his developmental level, and look for improvement by asking himself these questions:

- What developmental criteria does my performance meet?
- What's the developmental level of my performance?
- What am I doing well?
- What's the next developmental stage?
- How can I get there?
- What do I need to improve?
- Who can help me?



This continual focus on performance improvement illustrates the Japanese principle of kaizen that is a focus of many quality management programs. Kaizen teaches that waiting until the final performance to do any evaluating of the learner's progress will not lead to a quality performance. Continual self-assessment, adjustment, and stepwise improvement are needed to build quality in performance learning.

Performance learning is brain-friendly learning and leads to quality because it

- Focuses on what the student can do.
- Identifies how the student's performance has improved.
- Fosters a positive emotional climate for learning.
- Identifies the next stage in skill development.
- Provides criteria for each stage in skill development.
- Provides a framework for kaizen, or continuous improvement.

What Are the Developmental Stages in Performances? How Do We Evaluate Performance Levels?

Skill growth in all kinds of performances seems to follow a common path. As identified by Posner and Keele (1973), the phases of skill development are novice, advanced beginner, competent user, proficient performer, and expert. When the novice begins learning a skill, the coach gives him a rubric or performance checklist that describes the criteria for each stage of skill development. The novice can use this rubric to determine his performance level of development. By comparing his performance with the clearly stated criteria, he can decide what he is doing well and what steps he can take to improve. He also can use the rubric to decide what help he wants from the coach.

As he continues to practice and improve, the learner can chart his way through the performance levels. By comparing his execution with the indicators in the performance rubric, the learner may continually change his self-evaluation. He will decide when he has moved from novice performer to advanced beginner, from advanced beginner to competent user, and so on.

At the same time that the learner is using the rubric to self-evaluate, the teacher or his peers will observe his work and use the rubric to evaluate his performance level. The teacher, peers, and learner will use frequent conferences to compare their evaluations of the learner's performance, discuss any differences in their evaluations, and identify goals for improvement. The learner will develop a plan for improving his performance, and he may ask the teacher or his peers for help in carrying out his plan. He may, for example, ask for more frequent feedback about what he is doing well and what he can do to improve his performance. This self, peer, and teacher evaluation process works well so long as everyone involved in the process maintains a dual focus: what is the learner doing well already and what might he want to improve. The last evaluation of the performance learning task does not mean that the learner cannot continue to improve his skills. Growth and improvement stop only when developing the skill is no longer a high priority for the learner.

When the teacher writes the rubric, she may name the developmental stages using labels that fit the skill. The performance rubric for cross-country skiing (see fig. 1.1) shows an example of this kind of labeling. The developmental path of a cross-country skier could look like the following.

Novice

The coach introduces the novice skier to the equipment: skis, boots, bindings, and poles. The coach helps the novice prepare for skiing by showing him how to step into his bindings, move his skis with a sliding, gliding, kicking motion, and hold his poles. After the novice has had a chance to get the feel of the skis on the snow, the coach and the novice do a short run on a fairly level stretch of groomed trail. At this point, the novice wants to learn what the snow feels like under his skis, how to effectively coordinate his leg and arm movements, how to maintain his balance, and how to get up if he falls. At the end of the test run, the coach and the learner assess progress. They discuss what the novice has learned, how to practice effective skill use, and how to adjust the performance for improvement.

Advanced Beginner

Once the novice can coordinate his arm and leg movements and stay upright on the trail, he begins to practice starting, stopping, and moving on a level trail and on some gentle hills and feeling the rhythm of the sport. He focuses more on the experience of skiing than on the individual segments of the performance, although his primary focus is still on the performance. He still attends carefully to the movement of his body, but his skiing begins to flow. He can enjoy himself on the trail and does some independent practice. His falls become less frequent, and he begins to notice the nature around the trail. He and his coach discuss his learning and adjust his performance to further his skill development.

Competent User

The competent skier begins to think about the entire context of skiing. He may begin to explore new trails or look for places where he can do some off-trail skiing. This skier can now focus on the surroundings of the trail, so he will be very aware of the weather, the scenery, and the wildlife. He may want to experiment with different kinds of skis: wider and shorter skis for use off a groomed trail, longer and narrower skis for speed, "control" skis

Performance Rubric: Cross-Country Skiing

Developmental Level / Performance	Ouch!	Oops!	Mostly Upright!	Awesome!	Olympic!
Ski on the Level	"Feels" the skis. Experiences slipperiness of snow under the skis. Wobbles and bobbles occasionally. Falls 4 or more times in 20 minutes.	Falls 3 times in 20 minutes. Stays steady on skis 50% of the time. Starts and stops smoothly.	Falls 1 or 2 times in 20 minutes. Stays steady on skis 75% of the time. Stops, starts, and turns smoothly.	No falls in 20 minutes or longer. Stays steady and confident on skis. May give tips to novices.	"Face plants" only from exhaustion at the finish line after winning the gold medal.
Ski Uphill	Takes skis off and walks uphill with skis over shoulder. Walks in the groomed tracks.	Herringbone walks up all hills regardless of height or steepness. Stays out of the groomed tracks when not skiing.	Uphill skis 50% of hills, especially low hills or gentle slopes. Maintains enough speed to keep skis clean of built-up snow.	Uphill skis all but the steepest and longest hills. Stays steady on skis. Maintains balance and speed.	Runs uphill on skis, leaving others far behind. Very little loss of speed.
Ski Downhill	Takes skis off and walks downhill with skis over shoulder. Walks in the groomed tracks.	Sidesteps down steep or long hills. "Tucks and glides" down short, gentle hills. Stays out of groomed tracks when sidestepping.	Skis down most hills, except longest, steepest ones. Tucks and glides well. Wobbles a few times.	Skis down all except steepest or longest hills. Stays steady on skis. Maintains speed and balance.	Accelerates downhill. Poles vigorously to build up speed.
Manipulate Skis	Walks with jerky motions. Picks feet up to move skis forward. No push with heel and thigh; no push off with toe.	"Walks" at least 75% of the time. Pushes/pushes off 25% of the time.	Glides skis at least 75% of the time. Push/push-off action evident. Much smoother and looks more automatic.	Glides almost all of the time. Good push-off action and glide. Smooth, "natural," attends to surroundings.	Very smooth. Strong kick. Strong leg push. Releases poles in synch with stride.

Figure 1.1

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for icy trails. Different trails may have different kinds of snow, and the skier may want to learn how to wax skis for these varying snow conditions. As his skill progresses, he and his coach celebrate his success and look for further adjustments that will further develop his performance.

Proficient Performer

When the proficient skier is on the trail, he may realize that, for large chunks of time, he is not thinking about the skill at all. He is enjoying his surroundings and is performing his skiing without conscious attention. As his skiing becomes more and more automatic, he may find that he is now coaching novices. He is still very aware, when asked, of what he is doing and how it is working, and this awareness can help him become a very effective mentor to newcomers to "his" sport because he can explain what to do and demonstrate how to do it without forgetting any of the elements that a beginner needs to know. The proficient performer often enjoys creating his own trail to get to chosen destinations. He is relaxed, happy, and confident on his skis, even on difficult trails or terrain.

Expert

Other skiers watch the expert on the trail and say, "He's a natural." The expert is often so unaware of what he is doing that he cannot explain it to someone else. His unconscious, effortless use of the skill ensures flawless performance. Because the expert may forget about, or lose awareness of, key steps in skill development, he may not be an effective coach. His explanation or demonstration of a skill may omit details that the novice needs to be aware of in order to improve. The expert could be an Olympic champion. His performance abilities are so deeply embedded that he cannot imagine not knowing how to do the performance unconsciously and flawlessly.

Sometimes, a novice does not have a clear picture of an expert performing the skill that he is learning. The coach and the novice can study models of excellence and use the rubric to assess the expert performance. A novice skier, for example, may watch video clips of Olympic races to see how experts handle going uphill, skiing downhill, and maintaining speed on the level. If an expert collapses from exhaustion at the finish line, the coach may joke that "face planting" is allowed under those circumstances. The coach may also want to remind the novice that getting to the expert level takes years of practice and improvement, and emphasize that the novice will go through all of the developmental stages on the road to becoming an excellent performer. Figure 1.2 shows the different focuses of the coach and the learner.

Performance Development

Coach's Job

Give the learner models of expert performance.

Give the learner a rubric or performance checklist that outlines performance development stages.

Help the learner evaluate his or her performance.

Using the rubric, help the learner improve his or her performance.

Learner's Job

Use the rubric to evaluate present performance and identify what he or she can do.

Use the rubric to plan improvement in performance.

Ask the coach for help when needed.

Identify quality performance; maintain a vision of excellence.

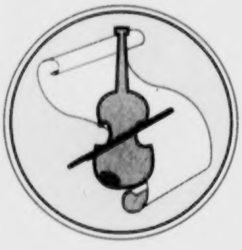
Figure 1.2

Why Does Performance Learning Work?

Performance learning is brain-friendly learning that creates a positive emotional climate that enhances students' ability to remember ideas and concepts as they perform tasks and learn skills. In this climate, students can reach a state of flow (Czikszentmihalyi 1990). They feel pleasantly challenged, the novelty of the skill or task engages their interest, they can use the performance standards or rubric to set personal goals and measure their progress, and they enjoy the learning experience. Teachers provide explicit instruction in the skills needed for the performance or task and the time for guided practice. Students are asked to reflect on their performances, use a performance checklist or rubric or to assess what they are doing well, and identify adjustments that could lead to improved performance. To round out the self-evaluation, students are asked to explain what help they need in improving their performances and what ideas, concepts, and skills they have learned. As they continually assess their performances, students learn lifelong self-evaluation and self-adjustment techniques that can help them lead happier, more satisfying lives. Students who are performance learners develop intelligent behaviors (Costa 1985) that can help them lead more effective lives: they become more flexible, more persistent, and more creative thinkers and doers who believe that they can learn and perform at a consistently high level of development.

PART I:

BASIC PERFORMANCES



Chapter 2

Rotting Peels and Cores

The Performance

As populations increase and available space for waste disposal decreases, more and more communities are adopting waste reduction policies and requirements. In some communities, each household still receives unlimited waste pickup service. In other communities, each household is limited to a maximum amount of waste that will be collected per pickup. Waste collection agencies are encouraging people to "reduce, reuse, and recycle" as much as possible.

One effective technique for reducing food scrap (and yard) waste is composting. As students learn to manage a compost pile so that these wastes are converted to rich fertilizer, they learn important science and social studies ideas and concepts and practice key math and language arts skills. As students assemble and manage compost piles, they will keep careful records of the techniques they use, how well those procedures work, how much time is needed to produce the compost, and how the final product can be used. Students will keep samples of the compost produced in several trials and display these during the final exhibition of learning.

To prepare for the final demonstration of learning, students will learn how to effectively communicate their composting research and its results. Some tools that will enhance this effective communication are oral descriptions of their composting processes and procedures, charts and graphs illustrating the processes, a brochure explaining composting, and a discussion of community attitudes toward waste disposal. Students may use these tools as they present their composting research performance to their classmates, other classes in the school, community organizations, or parent groups.

The Prompt

Several natural or organic fertilizing products available in gardening shops are composts. Mushroom compost is one of the richest products available.

The teacher may introduce students to this performance task by displaying several such products and then asking, "Do you know what compost is? Can you tell me where this comes from? Is it made in a factory? The label says 'organic.' What does that mean? Could you make this at home? What might you need to know?" Answers to these questions will show that compost is the end product of food scraps and yard waste. The product can be made at home, and students and their parents can manage a compost pile effectively by applying principles that affect the speed of physical or chemical changes.

The teacher will tell students that when they present the results of their learning to their classmates or others, they will be able to describe the different composting procedures they tried, identify the techniques that produced the best compost in a specific amount of time, display the notebooks containing their records and the final compost samples, exhibit charts and graphs comparing composting conditions and results, and give each member of the audience a brochure about composting. When the teacher introduces this task to the students, she will also announce the exhibition date.

The Vision

Examples of excellent composting results and communication of composting research in the presentation performance will give students a clear picture of the teacher's expectations. If this is a performance learning task the teacher has used in previous years, she could show samples of high quality compost prepared by former students. Compost samples will keep well from year to year if the teacher seals them tightly in plastic bags.

Students also may view videos of excellent presentation performances that demonstrate clear, concise, dynamic communication of the composting research and conclusions. The teacher may obtain videotapes of gardening programs from the Discovery Channel, Lifetime, or public television that portray demonstrations of effective composting. Students and teacher can analyze commercial posters for visual effectiveness and can discuss the elements they expect in an excellent expository presentation. As part of their commitment to excellence in local schools, nurseries and gardening shops may donate copies of commercial brochures explaining the uses of compost for students to inspect.

Before students begin the performance task, the teacher will want to be sure that they are familiar with the elements of effective field studies and excellent exhibitions of learning. To be effective learners, students will begin with the end in mind (Covey 1989).

The Standards

As the composting begins, students need to know what tasks they need to do to reach their goal. The teacher can show them an overview of the performance tasks, the developmental levels of the performance, and the content ideas and concepts they will be learning by using a task development chart (see fig. 2.1).

From the day they begin the performance task, students are preparing for the final exhibition of learning. To help them prepare a quality performance, the teacher will provide a performance rubric (see fig. 2.2) when she assigns the performance task. Students can use the performance rubric to self-evaluate their progress. They can see how their performance or products compare with the descriptions on the rubric, adjust and improve their work, and work toward a quality exhibition of learning. Every piece of the final performance that will be evaluated is listed in this rubric.

The Coaching Context

Setting Up the Task

After presenting the prompt and the vision, the teacher will outline the performance task for her students. The composting task will be done by teams composed of four students: the waste engineer who guides the group and keeps it on task and on time, the analyst who plans the graphics posters, the wordsmith who plans the oral presentation, and the pamphleteer who outlines the persuasive brochure. The teacher will assign the students to groups and give the groups time to get organized. Then she will outline the requirements for the final presentation. She will explain that each group will need to experiment with at least four different compost piles to examine the importance of scrap size, moisture, added ingredients, and mixing on the speed with which the garbage turns into compost.

For very young students, the teacher may need to explain they will need to have one compost pile that is their "control," a pile for which the scrap size and the other variables are predetermined. The teacher may want to suggest that this control compost pile contain small food scraps (bigger scraps may be cut or torn to get the desired size) that are kept slightly moist at all times. She may tell students to add a little dirt and a few worms at the beginning of the process and to mix or stir this compost pile every two or three days until the rotting process is complete (or until the end of the performance task time).

The teacher may suggest that the second compost pile contain large scraps that are kept moist, have dirt and worms added, and be stirred every two or three days, that the third pile contain small scraps that are kept dry, have dirt and worms added, and be stirred every two or three days, and that the last pile contain small scraps that are kept moist, have no added dirt or worms, and be stirred as the others are. Students may want to do an additional compost pile that is not stirred at all to investigate the importance of mixing. To keep the investigation manageable, the teacher may want to tell students that they will be using small-scale compost piles.

Task Development Chart: Rotting Peels and Cores

Performance Tasks	Developmental Levels	Curriculum Standards
Set up and manage the compost pile. Collect appropriate raw material. Manage scrap size, moisture, and additional ingredients effectively. Mix as needed for best results.	***Novice*** Scraps rot very little. Notebook contains initial entry and little else. Graphs are small, unlabeled, and messy. Pamphlet contains at least 5 factual/mechanical errors. Presentation is stilted and inaudible.	***Science*** Collect and interpret data. identify and describe physical and chemical changes. Analyze factors affecting the speed of a change. Discuss food web principles. Demonstrate basic safety practices.
Keep a detailed field notebook that includes a record of everything done to each compost pile and the results. These records include measurements, descriptions, and sketches or photos of the compost piles over time.	***Advanced Beginner*** 30% of scraps rot. Notebook contains initial/final entries and little else. Graphs are small, unclearly labeled, and messy. Pamphlet contains 4 factual/mechanical errors. Presentation is stilted, but audible.	***Math*** Display results in bar and pie graphs. Weigh raw materials accurately. Calculate percentages: weight of compost to weight of raw material.
Produce a bar graph comparing rotting times in the different compost piles. Prepare a pie graph showing the percent of the original material that rotted into compost in the different compost piles.	***Competent User*** 60% of scraps rot. Notebook contains initial/final entries and a few others. Graphs are small, clearly labeled, and clean. Pamphlet contains 3 factual/mechanical errors. Presentation is rehearsed, smooth, and audible.	***Social Studies*** Analyze effect of human activity on land. Describe attitudes toward land use. Identify individual contributions to social problems.
Prepare a pamphlet explaining how composting creates a useful product while reducing solid waste. Include a resources list in the pamphlet.	***Proficient Performer*** 80% of scraps rot. Notebook contains entries for most compost work. Graphs are large, clearly labeled, and clean. Pamphlet contains 1 or 2 factual/mechanical errors. Presentation is relaxed, rehearsed, and entertaining.	***Language Arts*** Write persuasively. Demonstrate subject/verb agreement. Edit for spelling and capitalization.
Present the results of the composting trials. Use teamwork and visual aids to enhance the presentation.	***Expert*** Almost 100% of scraps rot. Notebook contains illustrated entries for all compost work. Graphs are large, clearly labeled, and clean. Pamphlet contains no factual/mechanical errors. Presentation is relaxed, rehearsed, and entertaining.	***Library Media and Technology*** Find information on the Internet. Build a resources list that includes books, magazines, journals, and websites.

Figure 2.1

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Performance Rubric: Rotting Peels and Cores

Developmental Level / Performance	Garbage!	Ditch Dirt!	Soil Stretcher	Compost!	Finest Flower Food
Make Compost	Large, unchanged food scraps. Little, if any, rotting. Really bad smell (forgotten leftovers).	Some small pieces of unchanged food. Crumbling/rotting around the edges. "Dirt and worms" smell.	Small, light colored chunks. "What was this?" Soft and crumbly.	Small dark chunks. Some like crumbly dirt. Unique smell (may be quite strong).	Dark, crumbly, small pieces. Looks and acts like topsoil. Unique smell (may really stink!).
Keep a Field Notebook	Sketchy notes. No clear record of what was done when. No clear notes on results.	Clearly dated entries. Some missing information about scrap size, moisture, mixing, and additions. Little information about results.	Clearly dated entries. Charts showing scrap size, moisture, mixing, and additions are complete and clear. Gives information on some results.	Dates and times for all entries. Charts and descriptions of work done. Some sketches. Gives information on most results.	Dates and weather conditions for all entries. Charts, descriptions of work done. Sketches of compost piles and tools. Gives complete results, includes photos.
Create Bar and Pie Graph Posters	Small (10 × 20 cm or smaller). Faint, blurry, black and white, smudgy. Small images and writing. Confusing labels.	Small (20 × 20 cm). Black and white, legible at 3 meters. Some smudges or blurs. Clear labels.	Medium (50 × 50 cm). Some light color. Clean and unsmudged. Legible at 3 meters. Clear labels and legends.	Large (50 × 100 cm). Some bright colors. Clean, unsmudged. Legible at 5 meters. Clear labels and legends.	Large (50 × 100 cm). Bold, primary colors. Black outlines, crisp edges. Legible beyond 5 meters. Needs no explaining!
Write a Persuasive Pamphlet	Unclear message. 4 or more mistakes in spelling, capitalization, or subject/verb agreement. At least 3 sentence fragments.	Message can be understood on second or third reading. 4 errors in spelling, capitalization, or subject/verb agreement. 1 or 2 sentence fragments.	Message is clear and not explained. 3 errors in spelling, capitalization, or subject/verb agreement. No sentence fragments.	Message is clear with 1 or 2 supporting pieces. 1 or 2 errors in spelling, capitalization, or subject/verb agreement. No sentence fragments.	Message is clear with 3 or more supporting pieces. No errors in spelling, capitalization, or subject/verb agreement. No sentence fragments. It convinces me!
Participate in the Oral Presentation	Mutters and mumbles. Whispery voice. Solo speaker for team. Little or no eye contact.	Very low voices. Words clearly pronounced (if close enough to hear). Two speakers for the team, who glance at the audience.	Can be heard at a distance of 5 meters. Clear pronunciation and some inflection; all team members speak and look at the audience.	Audible at 7 meters. Clear pronunciation and "feeling" inflections. Team members take turns speaking. Solid eye contact.	Loud, clear, and spoken with feeling. Relaxed speakers engage the audience. Bravo! Bravo!

Figure 2.2

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Students can put three or four cups of food scraps in a plastic milk bottle to start each compost pile. The teacher can ask each student to bring in a one-gallon, high-density polyurethane recyclable container, such as the type used for milk and distilled water. Then, she or the students can cut off the top one-third, including the handle, of each container using a scissors. This plastic is soft enough to cut quite easily, and the resulting container will hold the composting mixture without leaking. If students bring in the caps for the plastic containers, the cut-off portions may be used to loosely cover the compost piles and reduce odors in the classroom. To label their compost piles, students can write on the plastic with permanent markers.

The teacher can ask each student to bring in a plastic container a few weeks before they are to start the task so that the compost containers are available at the beginning of the performance learning task. When students begin working with composting processes, the teacher will ask each of them to bring in a bag of food scraps from home to use in their compost piles. Each student will contribute five or six cups of food scraps to the team supply and will bring the scraps to class on the day that the composting process starts.

To protect the health and safety of her students, the teacher will require that they wear rubber gloves (and boots for backyard compost piles) when they work with compost and wash their hands thoroughly before handling any food or touching their faces.

Keeping the Notebook

The teacher will explain to her students that each person needs to keep a field notebook in which he or she records the set-up of each compost pile, how often he or she waters a pile and mixes it, any other actions he or she uses with the compost, and how the appearance and odor of the mixture changes each time the student works with the compost. A complete record could include sketches and photos of the compost piles at various times during the trial. To help students organize their records, the teacher might suggest they organize their information in a table or formatted entry (see fig. 2.3).

Timelines

Even the best-managed compost pile needs time to convert raw food scraps into finished product. At the beginning of the task, the teacher will tell her students that they will work with their compost piles for six weeks. During this time, students also will be planning their final performances, keeping their field notebooks, and planning their pamphlets and graph posters. Two weeks after completing their work with the compost piles, students will do the presentation performances. During those two weeks, the teacher will work with teams to help them assess their work, adjust and correct, and prepare quality materials for the final exhibition and performance.

Date:
Weather conditions:

Compost pile number:

What we did to this compost pile today:

Appearance of this compost pile today:

Food scraps we can still identify:

Sketches:

Figure 2.3

The Graph Posters

Each team will prepare two graph posters to show the effectiveness of the different composting techniques. One poster will show a bar graph and the other a pie graph.

For the bar graph, students will draw a vertical bar showing the days needed for half of the scraps in a pile to become black, crumbly compost. Figure 2.4 shows the time for scraps to become compost for two compost piles as indicated by the bars. Students may choose to indicate that the bars are for different compost piles by using different colors or patterns. The title of the graph says that students are discovering how to change the speed of a physical or chemical change.

As students set up their compost piles, they weigh the food scraps they are using. At the end of six weeks, the students will sort out any large pieces of remaining food scraps and weigh them. Teams can use this data to calculate the percent of the food scraps in each pile that rotted into compost. They will use pie graphs to show this information. Figure 2.5 shows pie graphs for two compost piles.

The teacher will provide the rubric criteria. Then, she and the students will brainstorm the rubric indicators. For example, they could decide that effective graph posters have the following elements:

- Large size (at least 50 × 100 cm)
- Bold colors (bright, primary colors or blends)

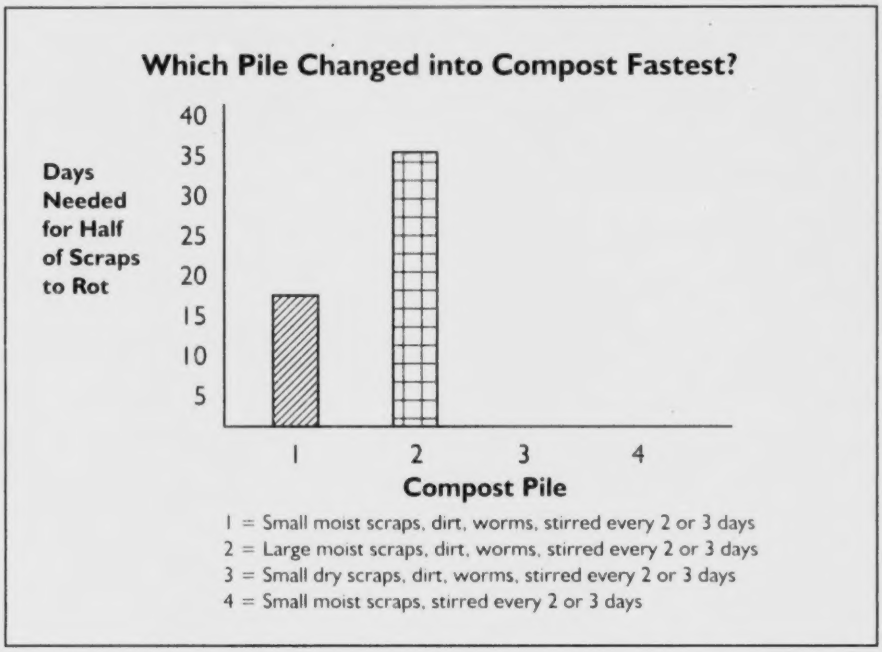

Which Pile Changed into Compost Fastest?
Days Needed for Half of Scraps to Rot
40
35
30
25
20
15
10
5
1
2
3
4
Compost Pile
1 = Small moist scraps, dirt, worms, stirred every 2 or 3 days
2 = Large moist scraps, dirt, worms, stirred every 2 or 3 days
3 = Small dry scraps, dirt, worms, stirred every 2 or 3 days
4 = Small moist scraps, stirred every 2 or 3 days

Figure 2.4

- Dark, clear lettering
- Legibility from a distance of at least 5 meters
- Labels, legends, and title explaining the graphs

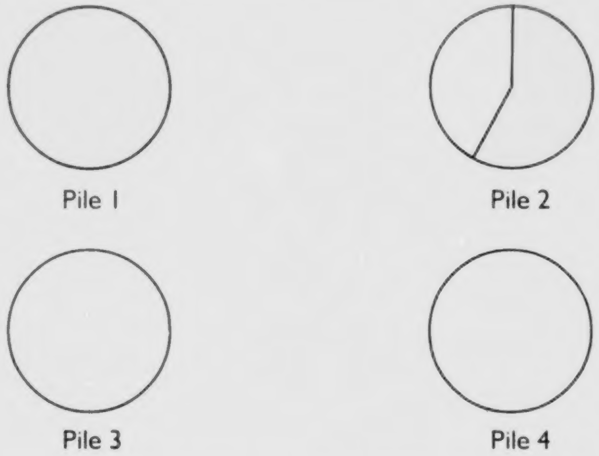
The performance exhibition rubric also contains criteria for the posters. Student teams may use the rubric to identify requirements for high quality graph posters.

The Persuasive Pamphlet

As part of the final performance, each student team will prepare a pamphlet in which they highlight the advantages of using food scraps as compost. Many communities have information available about the decreasing availability of landfill space, and the teacher may get a supply of brochures with this information for her students. The teacher also may want students to get information about composting, recycling (since composting actually recycles nutrients), and food webs from the local or school library or the Internet. The teacher will tell students that they will be creating a resources list for people who want more information about composting. Some websites that contain this information (as of this writing) are

- http://server2.greatlakes.k12.mi.us/explorer/desc/783751674447DED81.html
- http://science.coe.uwf.edu/SH/Curr/foodweb/foodweb.htm

What Percent Rotted?



1 = Small moist scraps, dirt, worms, stirred every 2 or 3 days
2 = Large moist scraps, dirt, worms, stirred every 2 or 3 days
3 = Small dry scraps, dirt, worms, stirred every 2 or 3 days
4 = Small moist scraps, stirred every 2 or 3 days

Figure 2.5

- http://www.yrbe.edu.on.ca/~mdhs/compsci/dpt3ar/ecology/efood.htm
- http://www.internet1.net/~recycle/backyard.htm
- http://www.jgpress.com/BCLinks.htm (includes links to many other sites)

Students will demonstrate their editing skills as they check their writing for subject/verb agreement, correct spelling, and correct capitalization. Students and teacher will brainstorm the performance indicators for the persuasive pamphlet, and they will brainstorm a detailed checklist of pamphlet features. Possible features are

- Has a catchy title.
- Presents a positive argument.
- Focuses on solutions, not problems.
- Contains relevant information.
- Is brief.
- Has a message.
- Looks good.

Students will use the performance rubric and the checklist to assess and improve their pamphlets until they are convinced they are presentation quality.

The Oral Presentation

When the teacher introduces this performance learning task to her students, she will tell them about the final presentation they will make to their classmates, another class in the school, a civic organization, or a parents' group. Because everyone in the class is involved in a similar performance task, the teacher and class may decide they want to demonstrate their learning to another class in the school. The teacher can make these arrangements.

The students and teacher will review the elements to be included in the oral presentation. Students will want to inform their audience about the task's background—their reasons for learning about composting. These reasons could include the social studies and science standards students are working toward as they do this task. Students will tell the audience what they did. They will describe the experiment's design and their composting results. To illustrate their performances, students will use their graph posters and may decide to prepare other visual aids. They may, for example, decide to produce a poster showing how scrap size, moisture level, added ingredients, and mixing varied among compost piles (see fig. 2.6).

Each team will prepare a copy of its persuasive pamphlet for each member of the target audience, and team members will distribute these pamphlets during the presentation. The team will have sealed bags of the compost from each pile available for members of the audience to inspect.

The teacher may show videos of news presentations and ask students to analyze what makes these presentations effective. To illustrate the difference between more and less engaging presentations, the teacher may want to include several clips, some that are very engaging (e.g., a reporter broadcasting from a toy show or during a storm) and others that are less involving (e.g., "talking heads").

Rotting Peels and Cores Differences

Pile Factor	1	2	3	4
Scrap Size	Small	Large	Small	Small
Moist or Dry	Moist	Moist	Dry	Moist
Additions	Dirt, Worms	Dirt, Worms	Dirt, Worms	—
Mixing	Every 2 or 3 Days	Every 2 or 3 Days	Every 2 or 3 Days	Every 2 or 3 Days

Figure 2.6

Students will be given time to practice and polish their presentations during class. The teacher may make video equipment available so students can actually see and hear their performances during rehearsals, compare them with the performance rubric, and polish them into high quality, engaging exhibitions of learning.

The Reflection

Each group will do a PMI chart (de Bono 1976) to reflect on and process its performance learning task. Group members will discuss the pluses, minuses, and interesting features of doing composting as a performance task.

Each student will complete several sentence starters as an individual reflection and meet with teammates to share responses. The team and individual reflections will help students cement their learning and form better cognitive patterns. Reflection also increases student awareness of the learning process and helps students expand their repertoires of effective learning tools.

Reflection

TEAM REFLECTION

Doing a Compost Pile

Pluses (+'s)	
Minuses (–'s)	
Interesting (!?'s)	

INDIVIDUAL REFLECTION

What I'm Thinking

- Three science learnings that I got from this task are ______________________
- My favorite science learning is ________________ because ________________
- Two writing skills I improved are ______________________________________
- I know these skills improved because ___________________________________
- One idea I'll remember about how I can help my community is _____________
- This idea is important because ____
- Here's how my science learning can help me do these food preparations faster: dissolve gelatin, cook vegetables

Chapter 3

Sound Bodies for Growing Minds

The Performance

Some observers have suggested that the 1930s' denizens of California's Muscle Beach were the twentieth century's pioneers in recognizing the role that physical fitness plays in developing mental health, emotional health, and intelligence. Today, research has established a solid connection between exercise and improved memory and creativity (Dientsbier 1989). Physical activity increases blood flow to the brain, enhancing the growth of neural networks. Intense activity prompts the body to release endorphins, the natural opiates that produce the state sometimes known as the runner's high. As children learn to perform a physical activity, they are giving themselves a brain-growing, intelligence-building tool they can employ during their leisure time for the rest of their lives.

In places that experience winter snows, cross-country (Nordic) skiing is an activity that gives students outside, aerobic activity during the cold months. In-line skating uses similar skills, and may be the exercise of choice in warmer climates. As students learn to ski, they also learn about the effects of exercise on overall physical, emotional, and mental health, investigate the link between exercise and intelligence, and develop a lifelong exercise skill.

Beginning skiers will not be ready, in a few sessions, to win an Olympic medal. They can learn to ski smoothly on fairly level ground, to negotiate small hills, and to stay balanced and upright on their skis. Beginners can use the experience to learn how a skill develops and to understand that steady improvement, not instant expertise, is the payoff for practice and persistence. At the end of a three-week unit introducing students to cross-country skiing, most students will be able to perform at the "mostly upright" or "awesome" levels shown in the performance rubric. They can use the rubric to see where their skill development started and how their performance has improved. At the end of the unit, each student will evaluate his or her personal fitness goals to see where to fit cross-country skiing into a winter activity program.

The Prompt

The teacher will introduce this performance learning task to his students by having them brainstorm a list of outdoor fitness activities used by adults they know during winter months. Some activities that could make the list are downhill skiing, cross-country skiing, ice skating, hockey, sledding, and snowshoeing. The teacher will poll students to find out how many of them do each of the activities. Then he will tell the students they will be doing some cross-country skiing to learn the sport, to investigate the steps by which individuals develop all skills, and to focus on physical activity as a tool for enhancing emotional and physical health and intelligence.

During this introduction, the teacher may show a video that features cross-country skiing as a leisure activity. He may bring in newspaper or magazine articles that describe the popularity of the activity or feature local trails. He may bring ski equipment into the classroom and show students how to hold the ski poles and fit boots into bindings. Students may be given the opportunity to try on school-owned ski boots and to practice getting into and out of the bindings and grasping and releasing the poles.

The teacher and students will focus on the importance of any aerobic exercise to overall health and fitness. Students will be learning about what aerobic fitness means and how to monitor heart rate and blood pressure. They might learn about good and bad cholesterol and the effect of exercise on cholesterol levels in the blood. The teacher and the students could discuss the impact of increased blood supply to the brain on intelligence, memory, and creativity.

To help students understand the value of persistence and the importance of decreasing impulsivity, the teacher will explain how skills develop. He will show, using the performance rubric as an example of developmental levels, how improvement builds in small increments, how continual monitoring of performance can lead to small adjustments, and how self-correction can lead to higher achievement. Because some students may believe that the only noteworthy performances are perfect performances, the teacher will stress the importance of giving themselves credit for what they can do and setting goals for achieving higher performance levels.

The Vision

The ultimate cross-country skiers are the Olympians. Students will view video clips of several of these athletes turning in medal-winning performances, and the teacher will tell the students that someday in the future, with practice and persistence, some of them may reach that level of excellence. He will point out that the majority of skiers are happy to become proficient performers.

To demonstrate proficient performance, the teacher will make a videotape featuring a good, local, adult skier. The tape will show the skier on the trail and will include the skier's comments about her enjoyment of the sport, how much leisure time per winter week she is on the trails, and what she does on the trails besides skiing. Talking with friends, listening to music, or doing creative brainstorming may all occur during exercise, and this information is important for students to know. The adult performer also will share her thoughts about the overall effects of skiing on her emotional and physical health, and she will comment on the activities she enjoys during warmer weather. This information will help students realize that enjoying physical activity during leisure time requires ongoing commitment. Fitness is not a single-season life choice. Individuals who are concerned about maintaining body soundness use a variety of physical activities throughout the year to reach their fitness goals.

The Standards

Before the teacher and the students go out to the ski trail for the first all-class ski, students will want to know what they are expected to learn and how they will be asked to demonstrate that learning. The teacher will take some time to explain and show examples of the performance learning task and answer students' questions.

As the teacher sets up this task, he will tell students that although the skiing is the focus performance, what they learn about lifelong fitness and the mental and emotional benefits of exercise are equally important. He will tell students he wants them to learn to ski and have fun on the trail, and he also hopes they build some personal behaviors around the goal of lifelong fitness activity. The teacher can build much of this initial discussion around the task development chart for the performance learning task (see fig. 3.1).

As students practice skiing, the teacher will help them focus on the strengths of their performances and points that need strengthening. He also will ask students to do background reading on the cultural context in which the sport developed, the present popularity of cross-country skiing as a fitness activity, the physical, mental, and emotional benefits of doing fitness activities, and the effect of aerobic exercise on intelligence and creativity. Students may work toward a quality performance by using the performance rubric (see fig. 3.2) to self-evaluate their progress, to identify their achievements, to decide on goals for improvement, and to make adjustments in their skiing, reading, and discussion that move them to a higher achievement level. Students may ask classmates or the teacher for help in reaching their improvement goals. Students who reach the proficient performer (awesome) level earlier than others may volunteer to do some peer coaching. Knowing the standards for the task will guide the students in their practice of kaizen and lead to higher quality performances.

Task Development Chart: Sound Bodies for Growing Minds

Performance Tasks	Developmental Levels	Curriculum Standards
Stay upright on skis for a 20-minute "graduation" performance at the end of the 3-week unit.	***Novice*** Tries on boots. Gets boots into and out of bindings. Practices proper pole grip and release. Chooses appropriate clothing—loose, layered, nonbinding. Gets the feel of the skis. Maintains balance and practices getting skis to glide. Learns the feel of falling. Presents ideas from reading by quoting.	***Health and Physical Development*** Demonstrate control in locomotor task: skiing. Demonstrate safe procedures on the trail. Explain the benefits of health-enhancing fitness level. Choose leisure activities that maintain healthy fitness. Assess personal fitness, set personal fitness goals. Aware of mind-body connection and synergy.
Read booklets, pamphlets, and website, newspaper, or magazine articles that discuss cross-country skiing as a fitness activity, describe local trails, focus on famous skiers, or examine the origins and historical development of the sport. Write short summaries of reading selections.	***Advanced Beginner*** Starts and stops smoothly. Glides skis on level trails. Uses poles to help legs and to maintain balance. Tucks and skis downhill (walks down longer or steeper hills). Herringbones or sidesteps up steeper hills. Stays steadier on skis, fewer wobbles. Shows some awareness of physical fitness. Quotes from reading and summarizes main ideas.	***Social Studies*** Analyze fitness activities as outgrowths of the cultures that produced them. Discuss cultural and historic attitudes toward physical fitness.
Investigate the connections between Nordic skiing and the cultures that produced it. Discover how some competition events that incorporate the sport, such as the biathlon, evolved in a cultural context.	***Competent User*** Good glide, diagonal action, and poling on level trails. Steady tucks and glides on most downhills, and little backsliding on most uphills. Far fewer wobbles and falls. Somewhat relaxed on the trail. Displays awareness of relationship of exercise and physical fitness. Paraphrases and summarizes reading.	***Language Arts*** Read for comprehension and information gathering. Summarize and generalize from reading. Communicate knowledge using precise vocabulary.
Use precise vocabulary to discuss the effect of exercise on physical, mental, and emotional health and the development of an "enriched brain."	***Proficient Performer*** Relaxes and enjoys the trail. Becomes very aware of the surroundings of the trail: terrain, wildlife, and trees. Chats easily with friends or does creative brainstorming. May start coaching novice skiers. Develops skiing flow. Exhibits fitness through exercise; summarizes well.	***Applications of Learning*** Identify the developmental levels of skill building. Recognize learner's own natural progression through the levels for learning each new skill. Use self-assessment and goal setting to achieve personal mastery.
Make simple health-related measurements such as pulse rate, breathing rate, and blood pressure. Compare pulse and breathing rates before and after skiing to determine the intensity of the workout.	***Expert*** Superb! This person looks like he or she was born on skis. Automatic, unconscious performance. Excellent in all aspects of the skill. May not be aware of steps needed to become proficient. May have difficulty explaining or coaching the sport to novices.	

Figure 3.1

Performance Rubric: Sound Bodies for Growing Minds

Developmental Level / Performance	Ouch!	Oops!	Mostly Upright!	Awesome!	Olympic!
Ski on the Level	"Feels" the skis. Experiences slipperiness of snow under the skis. Wobbles and bobbles occasionally. Falls 4 or more times in 20 minutes.	Falls 3 times in 20 minutes. Stays steady on skis 50% of time. Starts and stops smoothly.	Falls 1 or 2 times in 20 minutes. Stays steady on skis 75% of time. Stops, starts, and turns smoothly.	No falls in 20 minutes or longer. Stays steady and confident on skis. May give tips to novices.	"Face plants" only from exhaustion at the finish line after winning the gold medal.
Ski Uphill	Takes skis off and walks uphill with skis over shoulder. Walks in the groomed tracks.	Herringbone walks up all hills regardless of height or steepness. Stays out of the groomed tracks when not skiing.	Uphill skis 50% of hills, especially low hills or gentle slopes. Maintains enough speed to keep skis clean of built-up snow.	Uphill skis all but the steepest, longest hills. Stays steady on skis. Maintains balance and speed.	Runs uphill on skis, leaving others far behind. Very little loss of speed.
Ski Downhill	Takes skis off and walks downhill with skis over shoulder. Walks in the groomed tracks.	Sidesteps down steep or long hills. "Tucks and glides" down short, gentle hills. Stays out of groomed tracks when sidestepping.	Skis down most hills, except longest, steepest ones. Tucks and glides well. Wobbles a few times.	Skis down all except steepest or longest hills. Stays steady on skis. Maintains balance and speed.	Accelerates downhill. Poles vigorously to build up speed.
Manipulate Skis	Walks with jerky motions. Picks feet up to move skis forward. No push with heel and thigh; no push off with toe.	"Walks" at least 75% of time. Pushes/pushes off 25% of time.	Glides skis at least 75% of time. Push/push-off action evident. Much smoother and looks more automatic.	Glides almost all of the time. Good push-off action and glide. Smooth, "natural," attends to surroundings.	Very smooth. Strong kick. Strong leg push. Releases poles in synch with stride.
Understand Fitness Connections	Quotes reading verbatim. Uses poor choice of vocabulary. Can't find pulse. Wants to be a couch potato.	Quotes 75%, summarizes 25%. Searches for precise words. Measures pulse and breathing accurately. Primary physical activity moving a joystick.	Quotes 25%, summarizes 75%. Uses precise vocabulary with confidence. Shows good measurement skills. Walks uphill without getting winded.	Summarizes effectively. Uses vocabulary precisely. Works out 30 minutes a day 3 times a week. Knows how much his/her culture values fitness.	Writes original materials with vivid vocabulary. Hosts "Aerobicize with Me" 7 days a week. She/he knows it all and values personal fitness.

Figure 3.2

The Coaching Context

Explaining the Skills

As students begin this performance learning task, the teacher will tell them how to use the equipment (e.g., Push the bar on the toe of your boot into the slot in the ski binding. Push down hard! Pick up your foot. Is the ski attached?). He also will steer students toward booklets, pamphlets, other print materials, and Internet sources for information about the sport of Nordic skiing and general fitness. Some websites that had good information at the time of this writing include

- http://starnews.webpoint.com/fitness/index.htm
- http://www.crosscountryskier.com/instruct.htm
- http://commtechlab.msu.edu/sites/letsnet/noframes/Subjects/health/B8U4L3.html

Students will know that they need to be able to summarize what they have read to discuss it with the teacher and other students. The teacher will define and give examples of summarizing and paraphrasing.

Demonstrating the Skills

Before he asks students to summarize and paraphrase their reading, the teacher will demonstrate the skill for the class. He may give students a short reading selection with a summary, compare the two, and then ask the students to summarize the comparison. Then, he may give students another short reading selection and ask the students to write their own summaries and share them with a partner. Partners will ask each other for clarification and explanation of the summaries, and will help each other refine their summarizing skills.

Students also may need to see a demonstration of skiing skills. The teacher and other proficient performers can explain their movements to novices on the trail. The teacher might tell a novice to watch how he moves his body and say, "Now try to mirror my actions. Do you see how I'm planting weight on my forward ski and then pushing back with it? Try it yourself." Or he might say, "Can you tell how I'm shifting my weight over my skis? Watch where I have my head. If my back is straight and my head is up, my weight is over the back of my skis. That gives me better control."

The website <http://www.crosscountryskier.com> contains very good, illustrated explanations of skiing motion. Students may want to review the information available at this website before going on the trail.

Guided Practice and Feedback

As students read and discuss, the teacher will remind them to gather information about the history and popularity of the sport, the importance of fitness activities to general health, the effect of healthy physiology and exercise on emotions and intelligence, and the changes in attitudes toward fitness that have occurred within the past several decades in our own culture. Students will discuss what they have read with a partner, in small groups, or as a whole class. To help students remember what they have read and to practice their summarizing skills, the teacher will ask them to keep reading logs (see fig. 3.3).

Cross-Country Skiing Reading Log

Date:

Bibliography information:

Summary:

Related ideas from other readings:

Figure 3.3

Students will apply what they are learning about health and fitness activities by setting personal activity goals and keeping personal activity journals (see fig. 3.4).

Students will practice skiing. The whole class will use the school equipment and trail to work on skiing skills several times a week. The goal will be to help each student improve his or her performance by at least two development levels after three weeks of work. Each student will monitor the performance of a buddy. The teacher will assign students to buddy pairs at the beginning of the performance learning task, and buddies will help each other assess what they are doing well and what the next step could be in improving their performance skills. At the beginning of the performance task, some students might say they already have some skiing experience. The teacher may pair these students with the inexperienced skiers in the class. Students will learn to value other people's skills when they receive helpful coaching from a classmate who already is a proficient performer.

Test Run

Three or four class sessions before the final skiing performance, each buddy will use the performance rubric to give feedback to his or her partner. A

Personal Activity Journal

Date:

Activity:

Place:

Length of Activity:

Heart Rate:

Before Activity — Right After Activity

Based on how much I was sweating, my effort in this workout was
Select one:

comatose	televiewing	slow walking	full speed ahead	Olympic
☐	☐	☐	☐	☐

because ____________________

How much I liked this workout
Select one:

It stunk!	Bribe me to do it again!	I'd do it for free!	I'd pay to do this!	Awesome!
☐	☐	☐	☐	☐

because ____________________

My personal fitness goals are
Select one:

short term	long term
☐	☐

Figure 3.4

buddy might say, "Your balance is good. You don't wobble on your skis at all. When you go uphill, you slip back a little when you get near the top. Snow may be building up on your skis because you're slowing down. If you try to go a little faster, you might solve that problem. Do you want to try?" This test run will give students time to identify the parts of their skiing performance they want to adjust, and students will be able to improve their skills during the last few practice sessions. Using the rubric as an evaluation and improvement tool will help students fine-tune their performances and gain experience in using the performance assessment tool.

The Presentation

On the day of the performance presentation, two buddy pairs will work together to evaluate each other's skiing skills. The teacher will assign students to teams of four; each team of four will consist of two pairs of buddies who have been coaching each other throughout the performance learning task. Each student will do a twenty-minute ski that involves a portion of the trail where he or she can demonstrate uphill, downhill, and level skiing techniques. Students also will exhibit their skills with starts, stops, and turns. As one pair of buddies performs, the other pair will rate each individual's performance using the rubric. The pairs will then switch roles so that all four students have a performance turn and an assessment turn. The teacher will spot-check individual student performances and time the performance and assessment tasks.

Students and teacher may decide that they want to present to a wider audience. They could invite parents, school administrators, or other classes to attend the presentation. If teacher and students decide to invite others to the performance presentation, they will brainstorm and create an invitation (see fig. 3.5).

You're invited to our celebration!

Come and see how well we ski!

Date: Friday, February 26, 1999

Time: 2:30 pm

Place: the Snowville Middle School ski trail

Event: 20-minute Nordic ski demonstrating uphill, downhill, level ground, starts, stops, and turns

Medal Ceremony: after the ski

In case of a blizzard, the make-up day is the following Friday, March 5, same time, same place.

Figure 3.5

Every student who completes the performance presentation will receive a medal certifying his or her skill exhibition. These medals could be made of construction paper by the students as they prepare for the performance presentation.

Students will demonstrate the knowledge they gain from reading during the class discussions and by keeping reading logs. On the day of the performance presentation, the teacher will ask the students to place their reading logs in a designated place in the classroom: a reserved section of a book shelf, a display counter, or a special-use crate. Before students do their skiing performance presentation, the teacher will provide time for them to examine their classmates' reading logs. The teacher will explain that this is a way for students to learn more background information, and it is a technique that will generate feedback on the reading logs. Each student will write in each log they examine a positive comment about some new learning; for example, "From your reading log, I learned that people who live in Fairbanks, Alaska cross-country ski through the city in the winter. I think that would be fun." The teacher will ask each student to examine and comment on the reading logs of at least five classmates. Students then will record their new learnings and insights in their own reading logs.

The Reflection

After completing the performance presentation, each student will rate his or her own skiing using the rubric. Students will compare this self-evaluation with the observer's rating and will write answers to the following questions.

- What was I expected to demonstrate in this performance presentation?
- What did I do well?
- What do I want to improve?
- What can I do to improve?
- What help might I need, and who can help me?

Each student also will produce a visual, or set of illustrations, that show his or her personal understanding of the criteria for the development levels of this skill (see fig. 3.6).

The two buddy pairs that worked together for the performance presentation will get together to share these visuals. Each student will describe the events pictured at each level, his or her reasons for using that picture, and the feelings that the student has about this performance learning task. Students then will write personal reflections about the performance learning task. They will review their personal activity log entries and personal fitness goals, and they will use this review to write full, rich reflections as they complete "What I Learned as My Muscles Burned."

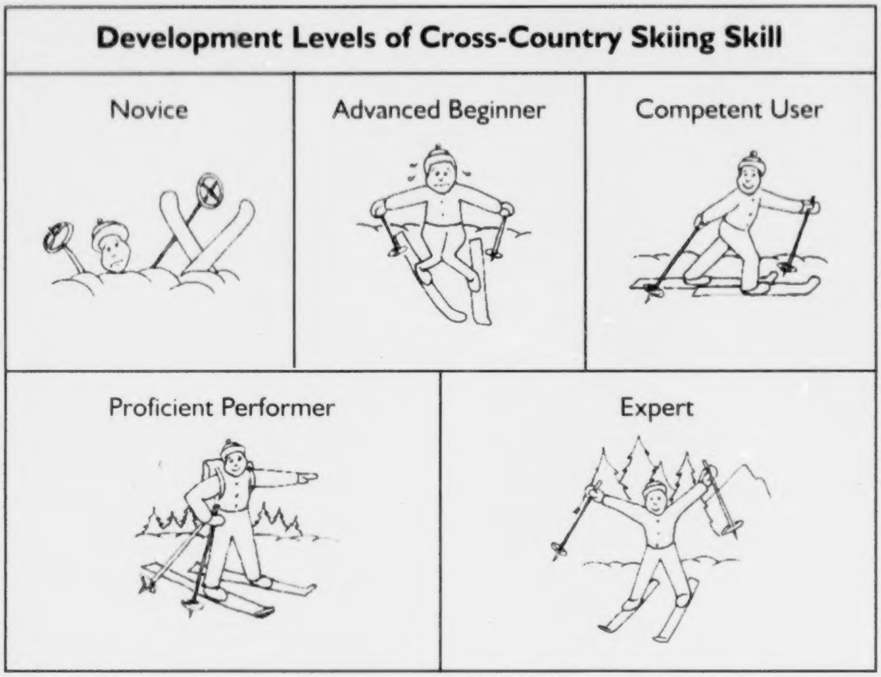

Development Levels of Cross-Country Skiing Skill
Novice
Advanced Beginner
Competent User
Proficient Performer
Expert

Figure 3.6

The teacher will display the skill development visuals in the room until the end of ski season to help students remember what they learned about fitness activities and the mind-body connection. As the learning focus shifts, he will encourage students to remember that the activities that help them maintain sound bodies also help them grow smarter, more creative, and more nimble minds.

Reflection

What I Learned as My Muscles Burned

My old thoughts about skill development levels:

My new understandings:

Why this is important to know:

My beginning skiing skill:

My skiing skill now:

My favorite part of skiing and why I like it:

My old picture of mind-body connections:

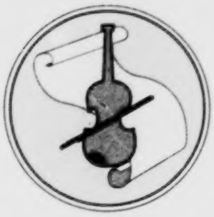
My new picture:

Why this is important to know:

My three favorite learnings of any kind and why I like them:

Chapter 4

Learning Brains and Music Strains



The Performance

Musical/rhythmic intellectual capabilities develop in every person before he or she is born. Lazear (1999) says that no other intellectual capacity develops earlier, and researchers suggest that learners who acquire information and ideas as they listen to certain kinds of music embed that information into their long-term memories most effectively. In examining why this is true, Jensen (1995) says that because music activates the limbic system along with the right brain, information associated with music includes some emotional content and, because of the emotional component, the brain is more likely to form neural networks to encode this information in long-term memory. Teachers of young children traditionally use music to glue information in their students' minds. Many adults still "sing" the alphabet in their heads to remember the order of the letters. Some adults will admit that, as youngsters, they believed that "lmnop" was a single letter. This is powerful testimony about the importance of music to learning.

Georgi Lozanov (1978) and other researchers have found that many kinds of music, including New Age, jazz, rock, folk, pop, and country as well as baroque and classical, can enhance learning. The music forms that produce the most predictable learning results are classical and baroque, especially adagios and largos, and particularly pieces incorporating higher frequencies. Lozanov recommends that students listen to classical or romantic era music during new learning and baroque during review. Mozart is the composer whose work is most often associated with enhanced learning, and for this reason, the link between learning and music is sometimes referred to as the Mozart effect.

Some of the best-known research on this connection came from Rauscher and her team (1993) at the University of California at Irvine. Three groups of students participated in an experiment in which each student took an intelligence test after engaging in a specific focus activity prior to the test. The control group sat in a quiet room for ten minutes, the second group

listened to a relaxation tape for ten minutes, and the third group listened to ten minutes of Mozart's "Sonata for Two Pianos in D Major." All participants then took the Stanford-Binet IQ test. The Mozart group scored eight to nine points higher on the spatial portion than either of the other two groups.

Dr. Rauscher and her team found that the increase in spatial IQ scores lasted for just a few days when students linked music to mental rehearsal for that single testing event. When students used music consistently during learning or review over several months (or years), the Irvine group found that the students experienced long-term increases in intellectual capabilities, particularly in spatial-temporal skills.

Many students may not be familiar with classical and baroque music. In this performance learning task, students will listen to selections by several classical and baroque composers and will work in teams of four to produce music videos featuring a work by one of the composers.

Students will use an instrumental recording of the composer's work to accompany their performance of lyrics and actions. The lyrics will highlight key information about the composer and his work and associates, so teams will want to research the composer's life to learn about his development as a musician, important early influences on his music, his sponsors, contemporary reviews of his works, his general acceptance or rejection by his peers, and details of his personal life.

Each student team will prepare an illustrated booklet—a companion piece to the music video—in which the team summarizes this information. For the presentation performance, student teams will create a poster that advertises their work, the music video, and the booklet. As teams do their presentations, they will use teamwork to relate the information from the booklet to their classmates, show the video, and answer questions about the composer or their insights into the role of music in learning.

The teacher will encourage her students to use the music video presentations to become acquainted with each of the classical or baroque composers. She will help students expand their understanding of the link between music and learning, and she will encourage students to listen to classical and baroque music at home. Students who want to purchase music can find many collections that contain brain-friendly movements from the works of these composers. The school music teacher or a clerk at a local music store can help students select pieces to play softly during learning and reflection. By learning about these composers and their music in this performance context, students are more likely to choose classical music as background music when faced with a challenging new learning task.

The Prompt

For several days before she introduces this performance learning task to her students, the teacher will use classical or baroque background music in the ways suggested by Lozanov (1978). As students work on new learning in small groups, the teacher will play selections from classical composers at low volume. While students reflect on their learning or write in their journals, the teacher will play baroque selections. When students begin to question this use of music in the classroom, the teacher will introduce the performance task. She may want to tell students about the research that supports her use of music, and she may want to emphasize that the music she is using to enhance learning has the most predictable results.

The students and the teacher will brainstorm examples of times when the students have used music or rhythm to enhance new learning. Someone will probably mention the alphabet song. Another student may have learned a song that teaches the names of the planets in order of their distances from the sun. Many students will remember the names of Santa's reindeer from hearing "Rudolph the Red-Nosed Reindeer." As they brainstorm, students will become more aware of the power of music in learning.

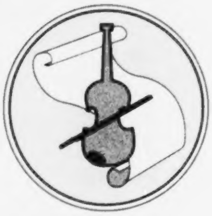
The teacher will assign students to teams of four, introduce the roles, and give teams a chance to distribute the roles among the members. Each team will include a conductor who leads the group and keeps it on time, on task, and collegial, a composer who selects music from a classical or baroque composer for use in a music video, a poet who polishes the team-generated lyrics for the video, and a choreographer who plans the movements that synchronize with the music and lyrics.

Then the teacher will outline the performance learning task and presentation. She will explain that the whole class will listen to and discuss selections from works by several baroque and classical composers, that each individual will record information about the musical selections and his or her enjoyment of the pieces in a listening log, and that each team will select one composer and produce a music video featuring a piece from one of his or her works. The team will research the composer's musical and personal life and write lyrics that feature some of the information the team members learn to accompany their selected piece of music.

Teammates will practice singing or chanting the song as they perform the movements planned by their choreographer. The final presentation performance will feature the music video, the illustrated booklet the team writes summarizing the composer's life and work, and the poster the team makes to advertise its presentation.

The Vision

To produce performance-level music videos of their own, students need to be aware of the features of professional work. The teacher will show carefully selected music videos to the class and then lead a brainstorming session to analyze the attributes of an expert or "symphonic" level music video. Some elements that will appear on this list are appropriate vocal volume, clear diction, good fit of lyrics to musical rhythms, good coordination between lyrics and actions, effective costumes, appropriate backgrounds, and enthusiastic performance of the piece of music.



The teacher also will provide carefully selected examples of movie posters for students to analyze. She will ask, "What features of these posters get you interested in moving closer to read the fine print? Do you want to see these movies? Why? What do these posters do to hook your interest?" The students and teacher will brainstorm a list of successful poster features, such as effective colors, large illustrations, clear lettering, use of action words, and emotional references (e.g., Audiences love it! The creature you'll love to hate!). Movie theaters often are happy to donate old posters to schools, so the teacher may be able to obtain these professional examples easily.

The Standards

Students who have no experience in matching lyrics to melody will need reassurance that songwriting takes time. The teacher will want to mention sources of help for beginning lyricists, such as rhyming dictionaries and thesauruses (both available online at websites such as<http://www.link.cs.cmu.edu/dougb/rhyme-doc.html> and <http://humanities.uchicago.edu/forms_unrest/ROGET.html>). She will encourage students to work on lyrics in their teams, because team brainstorming often unleashes creativity. The team poet will refine and polish these lyrics and submit the edited version to the team for final approval.

Early in the performance learning task, the teacher will give students the task development chart (see fig. 4.1), use it to explain and clarify the task, and answer questions the students have about the presentation performance. To help students understand the long-term goals of this performance task, the teacher will focus their attention on the listening behaviors described in the developmental levels column and say, "My long-term goal is to help you become more effective learners. I know that you can use this music as a tool to enhance and deepen your learning, and I hope that you choose to use baroque and classical music as a learning background at home and at school. As we learn about these periods in music history, you will be teaching each other about some of the composers and their work, and you will have information that you can use to select brain-friendly learning and review music."

When students do the presentation performance for this learning task, they will display and explain the poster, summarize and display the composer biography booklet, show the music video to the class, and answer questions about the composer's life and music. To help students prepare quality presentations, the teacher will give them the performance rubric (see fig. 4.2) as they begin the learning task.

Task Development Chart: Learning Brains and Music Strains

Performance Tasks	Developmental Levels	Curriculum Standards
Listen to and keep a log of background music. Be aware of emotions elicited by the music (e.g., sad, happy, calm, excited) and develop a feel for classical and baroque music.	***Novice*** Strongly dislikes classical and baroque music. Says, "This stuff is dumb! I want my MTV!" Asks, "Mozart who? Which Bach? What's a Vivaldi?" Doesn't recognize or identify emotional component of listening to music.	***Performing Arts*** Identify and effectively combine choreography elements; use movement expressively. Identify musical elements such as rhythm, melody, and form (e.g., rondo, theme, variation). Identify music pacing (e.g., allegretto, andante, adagio). Synchronize movement with music.
Meet the music video team and decide on roles. Pick the music piece for the video. Brainstorm the lyrics. Create lyrics for 4–5 minutes of music. Research background information on composer and musical period. Create rough drafts: booklet, advertising poster.	***Advanced Beginner*** Listens to classical and baroque without complaining. Recognizes some names: Haydn, Bach, Handel. Leisure listening does not include classical or baroque. Recognizes emotions elicited by music. Explains the importance of music sponsors.	***Visual Arts*** Produce graphics that demonstrate effective composition and use of color, line, and perspective.
Rehearse polished lyrics with music. Rehearse synchronized choreography. Plan costumes and pick a set. Revise booklet and poster; produce the presentation copies. Help with timeline showing composers and dates.	***Competent User*** Enjoys classical and baroque selections played in class. Recognizes some pieces and names the composers. Feels strong emotions when listening to some pieces. Might change leisure listening habits: "Maybe someday. This stuff really isn't so bad." Will go to live performances if someone else pays.	***Mathematics*** Analyze music timing and express results as a ratio. Produce a marked-to-scale timeline that includes the composers featured in all of the class's music video productions.
Complete costumes and set. Make the video. Sing or chant the lyrics. Keep lyrics synchronized with music. Perform the choreographed movements smoothly.	***Proficient Performer*** Taps foot, keeps time with hand, smiles when listening to classical or baroque music. Leisure listening occasionally includes classical or baroque selections. Knows personal history of favorite composers. Will buy own ticket for live performance.	***Language Arts*** Produce writing that shows sharp focus, precise use of language, logical organization of ideas, and appropriate support of main points. Demonstrate clear understanding of composer's biographical information.
Do presentation performance: • Introduce composer using the poster and booklet. • Show the video. • Answer questions about the composer. • Display poster and booklet. • Be ready to "check out" video to classmates.	***Expert*** Enjoys listening to classical or baroque music and shows it through body language. Owns several classical or baroque compact discs. Listens to classical or baroque several times a week. Sponsors local music organization or public radio. Has a season ticket to symphony or opera.	***Library Media and Technology*** Find musical period and composer information using the Internet. Evaluate the usefulness and accuracy of sources of information.

Figure 4.1

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Performance Rubric: Learning Brains and Music Strains

Developmental Level Performance	Monotone	Notes 'n Scales	Melodic	Harmonic	Symphonic
Choreograph and Write Lyrics	Nothing matches! Does not synchronize words, music, and movements. Uses jerky movements and less than 50% of space. Speaks with inaudible voice. Mumbles and stumbles.	Fits words and movements to music 50% of time. Uses jerky movements and 75% of space. Speaks with audible voice. Speaks incomprehensibly.	Fits words and movements to music at least 80% of time. Uses smooth movements and 75% or more of space. Uses audible voice and understandable diction.	Synchronizes words, movements, and music. Moves smoothly, filling almost all of the space. Uses clear diction, good volume and expression.	Composer's sister wrote the lyrics! Uses movements that are a natural fit! These kids belong in the Bolshoi Ballet company! Packs lyrics with expression and meaning!
Know the Composer	Gives correct name and close dates. Describes music vaguely. Provides no sponsor info. Provides no info on early influences. This could be any one of a dozen composers!	Gives correct name, dates, and family info. Omits composer's sponsor. Omits early influences. Gives 1 or 2 tidbits about composer's style.	Gives correct name, dates, family, and friend info. Names sponsor; provides no details of relationship. Cites 1 or 2 early influences. Describes style effectively.	Gives name, dates, family, friends and details well. Tells good story of relationship with sponsor. Identifies and details early influences. Describes style and importance to composer's period well.	Provides wonderfully complete and accurate information. Writes thumbnail sketch of composer's life and loves that could be included in a published collection. Bravo!
Make Costumes and Set	Performs in school clothes in someone's bedroom! Wears regular clothes, not costumes. Works in insufficient space for moves.	Attempts to disguise clothes. Uses period-looking shirts. Uses some makeup (e.g., hair powder). Films in school cafeteria. Does not give attention to backgrounds. Works in adequate space.	Uses period shirts, knee pants. Uses hair powder, feather "quill" pens. Films in school auditorium in front of stage curtain; uses neutral background. Works in adequate space.	Uses period shirts, knee pants, brocade vests. Uses hair powder, quill pens. Creates "parchment roll" music. Performs on stage using backdrop curtain. Works in generous space.	Uses period shirts, knee pants, brocade vests; loafers with "buckles." Uses hair powder and quill pens. Creates parchment roll music. Works in generous space.
Produce Biography	Provides no cover. Creates no illustrations. Contains 4 or more typos. Uses unclear focus. Omits chronology. Does not use musical terms to describe composer's work.	Uses paper cover. Uses 1 or 2 illustrations. Contains 2 or 3 typos. Provides most details in chronological order, adds 1 or 2 at the end. Focuses on composer. Describes work using musical terms.	Provides cardboard cover. Creates 3 or 4 illustrations including cover. Contains only 1 typo. Focuses on composer and sponsor. Lists all life details in order. Describes music precisely.	Provides hard, illustrated cover. Creates 4 or 5 illustrations. Contains no errors; uses clean copy. Focuses on composer, sponsor, colleagues. Provides good chronology and use of musical terms. Nice job!	Uses hard, illustrated cover. Illustrates every page. Uses copy-quality printing. Tells engaging, interesting story. Awesome!
Create the Poster	Small, 18 x 24 inches. Has many smudges and fingermarks. Includes lots of white-out. Writes in small, faint letters. Uses small, colorless pictures.	24 x 24 inches. Contains 2 or 3 smudges. Colors over white-out. Writes large, but faint (or small and dark). Uses large illustrations; arranges poorly.	24 x 36 inches. Contains no smudges or white-out. Writes legibly with large and dark characters. Includes large, interesting, colored illustrations; arranges well.	24 x 36 inches or larger. Very neat. Writes boldly and dramatically. Uses illustrations with good elements of composition and perspective.	24 x 36 inches or larger. Uses crisp illustrations on every page. Writes dramatically and with emotional "hook." Uses good composition, line, and perspective.

Figure 4.2

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The Coaching Context

Background Music

As the teacher begins her use of background music, she informs the students they will be working with these pieces and others in the near future. She tells them she wants them to listen with open minds and learn to appreciate the music. She instructs them to keep a listening log in which they record information about their enjoyment of each piece of music.

The teacher will write the name of each music selection, the composer's name, and the music period (baroque or classical) on the chalkboard each day. Each student will give a quick "thumbs-up, thumbs-down" enjoyment rating to each piece and briefly explain the reason for each rating. Students will provide more detailed information about each selection in their listening logs (see fig. 4.3).

Brain Building Music Log

Date:

Name of Musical Selection:

Composer: Period: Baroque | Classical

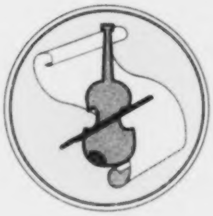
Enjoyment Rating: Reason(s) for Rating:

↑ | ↓ | ↔

Figure 4.3

Music Exploration

Before student teams select their composers and gather biographical information, the teacher and students will take some time to listen to and analyze music together. The teacher will help students determine meter and pacing. She will explain the music terms for pacing and play examples so students can hear pacing differences. The teacher and students will discuss the emotional enjoyment (or discomfort) they feel while listening to these music selections. The teacher will model this describing of emotional enjoyment to show students how to strengthen their explanations with references to the music. The teacher may say, for example, "When I listen to the first few minutes of Vivaldi's 'Spring,' I feel very happy. The up-tempo pacing and higher frequency notes give me a feeling of energy. I want to dance to this music. The trilling sounds to me like birds singing in the spring. I really like spring. I enjoy seeing the new growth, hearing water running out of snowbanks, and smelling the fresh air."



Because some students may feel self-conscious about describing their reflections about and enjoyment of the music for the whole class, students will begin these discussions in their small, video-production teams. The important point is to help students realize that music helps cement learning by engaging the emotions, and the teacher will want students to discuss and analyze their involvement with the music in an emotionally safe setting that promotes higher-order thinking and deeper learning.

Researching the Composers

Students will need to gather some information about their composers and the music periods in which they worked. The teacher will remind them to find biographical information about their composers, descriptions of the composers' styles, who (in role and rank in society) sponsored music during the baroque and classical periods, and who sponsors music today. Students will compare the role that these classical composers played in their societies with the role occupied by rap, rock, and pop composers and performers today. Students may find some of this information in the school or classroom library. The teacher also may encourage students to look for information on the Internet. Following are sites (at the time of this writing) that contain excellent information.

- http://www.lili.org/education/fnarts.htm (many links to music and fine arts sites)
- http://www.geocities.com/Athens/2405/links.html (Music Education Online site)
- http://www.ucop.edu/tcap/resources.mused.html (sponsors and supporters of music)
- http://www.radio.cz/hudba/indexeng.html (Czech radio's history of music with biographical thumbnail sketches of composers)
- http://www.classical.net/music/comp.1st/ (composer biographies with links to other sites and lists of works)

Producing the Music Videos

After the class has listened to and discussed the work of at least eight composers, each team will choose its composer and the musical selection for its video and do the biographical research. At this point, the teacher will give teams time to brainstorm their lyrics, do a rough draft of the biographical booklet, and produce sample layouts for the advertising poster. The class also will need time to draw a timeline on a long strip of paper. Students will need to measure the strip's length and determine the number of years to be used in the timeline to calculate the scale (inches per year) of the timeline. Once they know the scale, students will use markers and a straight edge to draw the timeline. The scale for this timeline needs to be large enough to allow room to write in the composers' names. A portion of the finished timeline could look like the one shown in figure 4.4.

1680	G. F. Handel (1685–1759)
1690	
1700	
1710	
1720	
1730	F. J. Haydn (1732–1809)
1740	L. Boccherini (1743–1805)
1750	W. A. Mozart (1756–1791)
1760	
1770	
1780	
1790	
1800	
1810	F. F. Chopin (1810–1849)

Figure 4.4

The teacher will give teams time to review and approve the polished lyrics for their videos and to practice singing or chanting these lyrics to the background music. She can get tape or CD players from the music or media specialists in her school, and she will encourage teams to play their music very softly so that several teams can practice in a limited space. During this practice phase, teams also will plan their costumes and background decorations, or sets, for the final video production. Teams will edit and produce the presentation copy of the biographical booklet, and they will select a final poster layout and create the advertising poster.

The teacher and the student teams may need to schedule special times for actual production of the music videos. If students want to use the school auditorium, they will need to reserve a time when they can use that facility. The school's media specialist can help set up the videotaping equipment and show students how to use it. The teacher or the media specialist will want to be available to coach and help students during taping. The teacher will announce the date by which all videos must be ready for the final presentation, and she will help teams adjust the filming schedule so that all teams can meet the deadline.

The Presentation

The teacher and students may decide that they want to invite parents, school administrators, or other teachers and students to attend the presentation performances of the music videos. They will design an invitation to announce the event (see fig. 4.5).

You are invited
to attend a
PREMIER SCREENING
of music videos featuring
the lives of classical and baroque
composers.

Presented by
Ms. Allegra Andante and her students
Friday, April 23, 1999
12:30 pm to 3:30 pm
(with an intermission)

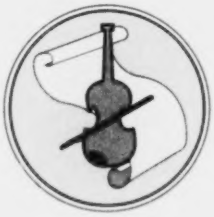
RSVP by April 19

Figure 4.5

Members of the class will greet their guests, usher them to seats, and invite them to share in refreshments during the intermission. The teacher and students will discuss what happens at movie premieres and decide how they want to manage the formal presentation performance.

Before the premiere, each team will be scheduled for its order of appearance for the presentation. The class will prepare a program for the audience that includes, for each music video, the title of the video (and the featured composer), the names of the team members, and the name of the featured musical selection. Ushers will give programs to audience members during seating.

As each team takes its turn, the conductor will introduce the team members by name and role, announce the video's title, the composer's name, and the musical selection, and explain why the team chose that composer and music as its focus. The poet and composer will summarize the biographical booklet, and the choreographer will present and describe the advertising poster. After this introduction, the team will show the music video and then answer audience members' questions about the video's content, the choice of lyrics, the composer, and what the students have learned about the connection between music and enhanced learning. The teacher, classmates, and other audience members will help each team celebrate success with applause and bravos.



The Reflection

After the presentation performances, the posters, booklets, and videos will be on display in the classroom. The teacher will give each team several large sticky notes, and teams will perform a gallery walk, visiting each set of performance materials, writing a positive feedback comment about the presentation on a sticky note, and placing the sticky note on the performance poster. At the conclusion of the gallery walk, teams will collect the sticky notes on their posters, read the feedback comments, reflect on a series of questions (see "Team Reflection Questions"), and discuss their thoughts.

Students will have been keeping individual listening logs in which they record musical pieces they listen to and rate them according to their listening pleasure. The teacher will instruct students to add information to this log for the rest of the school year. She will be playing music as students learn new information and reflect on their learnings. She will suggest that students listen to classical and baroque music outside of class, and she will ask them to include information about these musical experiences in their listening logs. (See "Listening Log" for a sample entry.) She will tell students that she will find and play classical or baroque selections that they request.

In addition, each student will transfer what he or she has learned about rhythms to nonmusical settings by jotting down individual reflections twice each week for the month following the video presentation. (See "Rhythms in My Life Today" for a sample entry.) As students discover the rhythms that exist in everyday activities, they will become more aware of the effect of these rhythms on their emotions, and they will become better at choosing helpful background sounds as they study and learn.

Reflection

TEAM REFLECTION

Team Reflection Questions

What were we asked to do in this performance learning task?

What do we think we did well?

What do our classmates say we did well?

What would we improve next time?

Our "top three" learnings about our composer (or classical music in general) are

On a scale from 1 (low) to 5 (high), our enjoyment of classical music is a _________
because

Reflection

INDIVIDUAL REFLECTIONS

Listening Log

Composer	**Music Selection**	**Personal Enjoyment**
J. S. Bach	Bist du bei mir	4
W. A. Mozart	"Jupiter" symphony (molto allegro)	5
G. F. Handel	Water Music Overture	4
A. Vivaldi	The Four Seasons: Spring: Danza pastorale	4

Rhythms in My Life Today

Rhythm (Source)	**Pacing**	**Associated Feelings**
uumph, uumph, uumph (tires on the road)	andante	hurry, scurry, tense
tick-tock/tick-tock/tick-tock (Mickey Mouse wall clock)	largo	restful, peaceful
alub, alub, alub, alub (heartbeat after gym class)	andante	run, play, happy, excited

Chapter 5

Making Sense of Stories

The Performance

Reading comprehension is a function of the attentiveness of the reader. If the reader's eyes and mind are focused on the story in front of her, she will probably be able to discuss its characters, setting, and plot. A reader whose attention is engaged will be able to infer the story's theme and the social principles or beliefs associated with the characters' actions. The intent reader may want to predict the unwritten sequel to the story and support her predictions with evidence from the text. As a focused reader works through a story, she may make connections with other stories, comparing and contrasting the literary pieces. Robert Sylwester (1995) says that emotion drives attention. To secure the attention of student readers, the teacher can give them a task that asks them to identify key information from a story and to analyze clues to determine its theme and underlying principles.

As they do this performance learning task, students will read a story and write a people search to use as a postreading review tool. A people search is an interactive classroom strategy that gets students moving around the room, forming temporary partnerships, and exchanging information about a focus topic. To promote higher-order thinking, the teacher will give his students a copy of the Three-Story Intellect diagram and tell them to use second- and third-story verbs to write two-thirds of the people search questions. He also will tell the students they need to be able to write complete answers for all of the questions they ask.

By using this assignment structure, the teacher will create the expectation that students will understand the story. As students ask and answer first-story questions, they will demonstrate their knowledge of the story's facts. Students will demonstrate their abilities to infer theme, values, beliefs, and future actions as they write and answer second- and third-story questions. The higher-level questions also could involve comparing this story with others students have read or with their experiences from everyday life.

The people search writing assignment will focus the students' attention on the reading task and help them improve their reading comprehension. Because this is an active reading task in which students are creating their own questions about the story, students who are engaged in the task may find themselves in a state of flow (Czikszentmihalyi 1990).

The performance learning task incorporates many of the elements Czikszentmihalyi says define this highly involved, positive state. Students who are doing the task will have a clear goal, which is to write and answer the people search questions. Because students are familiar with the kinds of questions the teacher typically asks about a story, they will find the challenge of the activity closely aligns with their skills. Students will begin this task with the goal of writing the people search, so they will receive continuous feedback as the task progresses because they can see the questions and answers they are compiling.

Students will be unconcerned about threat or danger as they do the task because they are creating the reading comprehension assessment tool. Students often feel intimidated as they read because of the judgmental evaluation they know will come at the end of the task. They focus on guessing what the teacher wants them to know, so they concentrate on the details of the story and spend little time analyzing the central theme. When students write the questions, they focus on the activity of question writing and answering, and, if the teacher has specified the use of second- and third-story verbs in their questions, the students will look for patterns, core issues and themes, and connections to other stories or everyday life.

To provide an audience for this performance learning task, students will ask members of another class to read their target story, do the people search review, and provide feedback about the effectiveness of the people search in reinforcing learning. Just as the people search helps students review the facts and concepts from the story they read, comments from members of another class will facilitate a review of the writing process and using the people search. Jensen (1995) notes that frequent feedback is a vital key to boost learning and intelligence. By reviewing the story and the process, students will acquire more complete knowledge and understanding of the content they learned and the skills by which they learned it.

The Prompt

After the students have read a story, the teacher will tell them that they will use an interactive strategy called a people search to review what they have read. The teacher will give each student a copy of the people search questions (see fig. 5.1) and explain the procedure.

The teacher will tell the students that as they do a people search, they will be collecting information and insights from their classmates. He will give them several suggestions (see fig. 5.2) and may want to give each student a copy of these suggestions or post them in the room.

A Playful People Search: *Jumanji*

Find someone who can respond to each of the following questions or instructions. Ask that person to tell you the response and to sign this sheet next to the appropriate question or statement. A person can sign only one time.

1. The title is the name of two things in the book. What are they?

   ____

2. *Get two different people to sign this one.* Who likes to eat pumpkin pie? What actress had Munchkin friends?

   __________ __________

3. Sketch two clock faces. Set the hands on the first clock face for the time at the beginning of the story. Set the hands on the second clock face for the time at the end of the story.

   ____

4. Do a sequence cartoon that pictures the action in the story using the house's floor plan as a map.

   ____

5. Rank the adventures in the story from least scary to most scary.

   ____

6. "We interrupt this story to . . ." What happens when the parents come home before the children finish the game?

   ____

7. The Jumanji game is like [a kind of food] because both [have these three things in common].

   ____

8. What quote from another story best sums up the theme in this story? Explain your choice.

   ____

9. Write the ending for *Jumanji 2*. Tell why you chose this ending.

   ____

Figure 5.1

Doing a People Search

1. Get out of your chair. Move around the room.
2. Make eye contact with a classmate. Smile and address the person by his or her first name.
3. Say, "Do you need someone to answer number [one or two . . . pick a number]? I can do that!"
4. Give and explain the answer. Ask the person to paraphrase what you said to check for understanding. Sign the person's people search sheet.
5. Ask the person to answer and explain a question for which you need a signature. Paraphrase and get the signature you need.
6. Say, "Thank you," and move on.
7. Be ready to contribute to a class discussion of the answers to the questions when the people search time has expired.

Figure 5.2

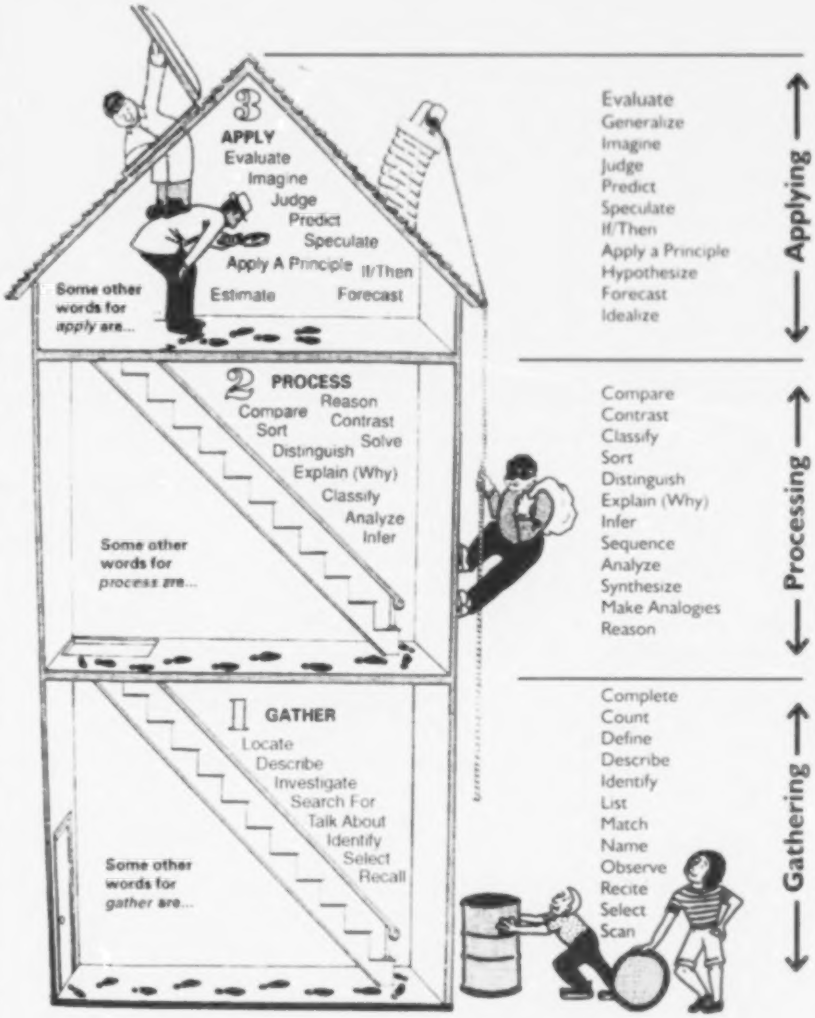
The teacher will stress that a classmate may give and explain only one answer to a person, so the students will need to contact as many classmates as there are people search items. After checking to be sure that students understand the procedure, the teacher will ask students to do the people search.

After the designated time, the teacher will ask all students to regroup and will facilitate a discussion of the answers to the questions. The teacher will ask students to analyze the structure of the people search. First, the teacher will ask, "Did you take more time to answer some questions than others? Which questions required longer answers? Why do you think you wanted more time to answer those questions?" The teacher and class will take some time to identify the questions that students spent more time answering.

Next, the teacher will give each student a copy of the Three-Story Intellect diagram (see fig. 5.3) and explain the concept of one-story, two-story, and three-story verbs. He will tell the students that questions using first-story verbs are fact- and information-collecting questions that test recall of details from the reading. Questions using second-story verbs are information-processing questions that encourage analysis of the reading. Third-story questions stimulate evaluation of the reading and encourage comparison with other selections, creation of new endings, and/or prediction of sequels.

Then the teacher will ask students to identify the levels of the people search questions. Students can do this by focusing on the verbs in the ques-

The Three-Story Intellect


3
APPLY
Evaluate
Imagine
Judge
Predict
Speculate
Apply A Principle
If/Then
Estimate
Forecast
Some other words for *apply* are...
2
PROCESS
Reason
Compare
Contrast
Sort
Solve
Distinguish
Explain (Why)
Classify
Analyze
Infer
Some other words for *process* are...
1
GATHER
Locate
Describe
Investigate
Search For
Talk About
Identify
Select
Recall
Some other words for *gather* are...
Evaluate
Generalize
Imagine
Judge
Predict
Speculate
If/Then
Apply a Principle
Hypothesize
Forecast
Idealize
Applying
Compare
Contrast
Classify
Sort
Distinguish
Explain (Why)
Infer
Sequence
Analyze
Synthesize
Make Analogies
Reason
Processing
Complete
Count
Define
Describe
Identify
List
Match
Name
Observe
Recite
Select
Scan
Gathering

From *Start Them Thinking: A Handbook of Classroom Strategies for Early Years,* by Robin Fogarty and Kay Opeka, © 1988 by IRI Skylight Publishing, Inc., p. xvi.

Figure 5.3

tions. The teacher will ask, "How does the question level relate to the length of time involved in answering a question? Do you see any patterns? What relationship do you see?" Students will say that the questions on which they spent more time were second- and third-story questions. Finally, the teacher

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will ask, "Why are some first-story questions good to have on a people search?" He will help students understand that inference, analysis, and prediction are helped by the solid, factual base provided by the information-gathering questions using the first-story verbs.

The teacher will ask students to reflect on the people search review strategy using de Bono's PMI (1976): "To review our learnings from story reading, how is using a people search . . ."

Plus	**Minus**	**Interesting**

Figure 5.4

After the students and teacher have finished the debriefing, the teacher will tell the students that they will begin this performance task by reading a new story and writing the people search review as they read. In small teams, students will use their individually written people searches to create a team composite. The whole class will use these team people searches to create a consensus version. Students will use the people search to review the story. They will evaluate and revise the people search, and then they will ask members of another class to read the story, use the consensus people search to review what they have learned, and give feedback about the quality of the people search and the effectiveness of using a people search to review learnings from a reading selection.

The Vision

Before students do their active reading task, the teacher will show examples of people searches and ask them, "Which of these people searches would you rather do? Which might be the most fun? What are your reasons for your answers?"

Fogarty (1997a) suggests that effective people search items spirit key issues through the back door. She says that students will be more engaged in people searches that are focused and fun. The teacher can demonstrate this by giving students examples of both serious (see fig. 5.5) and playful (see fig. 5.1) people searches.

A Serious People Search: *Jumanji*

1. What does the title of the book refer to?
2. State the names of the main characters.
3. Identify the time of day when the story takes place.
4. Outline the events in the story.
5. Describe the event in the story that scared you the most.
6. Explain why Mother and Father didn't believe the children's story about what happened while they were gone.
7. Forecast what Mother and Father would have found when they returned if the children had not finished the game.
8. What is the theme of this story?
9. Predict what will happen in the sequel to this story.

Figure 5.5

The teacher could ask students, "If emotion drives attention, which of these people searches would you find more emotionally engaging? For what reasons? How would doing this people search help you understand the story better and remember it longer? What does this tell you about writing a people search of your own?" The teacher and students will discuss the answers to these questions before the students do the performance learning task.

The Standards

The teacher will give each student a copy of the task development chart (see fig. 5.6) for this performance learning task after students have completed the initial people search. Because students may become so engrossed with writing the people search for the new story they lose sight of the big picture, the teacher will use the task development chart to remind students that their primary goal is enhanced reading comprehension. Writing the people search is one way to facilitate higher-order analysis of reading selections because students must look for central patterns and themes in order to ask second- and third-story questions.

Task Development Chart: Making Sense of Stories

Performance Tasks	Developmental Levels	Curriculum Standards
Read a story and do a teacher-written people search review. Practice the rules for doing a people search. Inspect the people search structure for first-, second-, and third-story intellect questions.	***Novice*** Identifies characters and some actions in a story. Sequences actions and/or summarizes plot with difficulty. Cannot identify central theme, concepts, principles, or patterns or connect with other reading. Uses mostly first-story questions.	***Language Arts: Reading*** Check and clarify for understanding by rereading and retelling. Use story information to ask and answer questions and make predictions. Analyze text for point of view, theme, and important principles. Compare and contrast with other stories. Summarize information from a story using a variety of graphic organizers (e.g., five fingers for who, what, when, where, why; Venn diagrams to compare and contrast; sequence charts or chainlinks to summarize plot; right angle for fact and feeling or action and feeling, etc.).
Read a new story. Write a people search while doing the reading. Include first-story fact finding; second-story analyzing, explaining, comparing, and inferring; third-story predicting and evaluating.	***Advanced Beginner*** Identifies main characters and their actions; sequences actions with 75% accuracy. Forgets some of the key events in the plot. Cannot identify central theme, concepts, or patterns or connect with other reading. Uses second/third-story questions 25% of time.	
Teams: Use individual people searches to write composites. Class: Do gallery walk to produce consensus people search. Class: Use people search to review the story.	***Competent User*** Identifies main characters; remembers and sequences at least 75% of the key action in story. Cannot verbalize theme. Compares with at least one other story and gives reasons. Uses second/third-story questions 50% of time.	***Language Arts: Writing*** Write questions using complete sentence structures and clear syntax. Use precise, descriptive vocabulary in questions and answers. Edit and revise questions for word choice, spelling, punctuation, and syntax.
Individuals: Write story test, including • Summary of plot and characters. • Discussion of theme and values. • Analysis of question writing for comprehension strategy.	***Proficient Performer*** Identifies and describes most characters and summarizes plot accurately. Identifies the theme and at least one other story with the same theme. Identifies at least one contrasting story. Uses second/third-story questions 50% of time.	***Thinking Skills*** Ask questions at a variety of cognitive levels. Demonstrate critical thinking skills of analyzing, sequencing, and summarizing. Demonstrate creative thinking skills of brainstorming, inferring, and predicting.
Audience Class: Read the story, do the people search review, and give feedback. Performance Class: Review and analyze feedback to sharpen questioning skills. Individuals: Use question-asking strategies while reading.	***Expert*** Describes characters vividly and sketches plot. Supports theme with underlying principles or beliefs. Compares/contrasts with several other stories using plot, theme, and characters. Uses second/third-story questions at least 60% of time.	***Social Studies*** Connect the theme of the story to the values and beliefs of the culture that produced the story.

Figure 5.6

Performance Rubric: Making Sense of Stories

Developmental Level Performance	Nonsense	Scrambled Sense	Sensible	Common Sense	Perfect Sense
Identify Characters and Plot	Names main characters. Forgets other characters. Can't link characters to action or sequence of story events.	Knows main characters and at least one other. Forgets relationships among characters. Links characters to action with 50% accuracy.	Knows most of the characters. Correctly identifies 50% of the relationships among characters. Links characters to action with 75% accuracy.	Knows most of the characters and their relationships. Links characters to action with 75% accuracy. Gives complete plot summary.	Knows most of the characters and their relationships. Links characters to action with 90% accuracy. Gives complete plot summary.
Infer Theme, Principles, and Sequel	Sees no underlying beliefs/principles behind actions/events. "When the story is over, it's over! What do you mean, what's next?"	Vaguely perceives beliefs behind actions. Sees no principles illustrated by the story. Creates a new story for which there is no evidence in the original.	Ties characters' actions to core beliefs or values. Vaguely senses universal principle illustrated by story. Writes a sequel faithful to the characters' beliefs.	Illustrates accurate analysis of core beliefs of characters and principles by the unfolding story. Writes a sequel faithful to the characters' personalities; not so strong on events.	Analyzes beliefs and principles accurately; provides evidence to support analysis. Writes a sequel that could have been written by the original author!
Recognize Patterns; Connect to Other Stories	Makes no connections; forms no patterns. "A story is a story is a story!" Does not compare to other stories.	"*Winnie the Pooh* is like *Three Little Pigs* because they both have pigs!" Provides superficial connections. Compares only, no contrasting.	Sees some story patterns: family relationships, actions such as caring for pets, events such as being frightened or happy. Names a few stories with similar patterns.	Sees some story patterns: families, actions, and events. Names a few other stories with similar/contrasting patterns.	Sees some story patterns: families, actions, events, beliefs, or principles such as compassion, respect for others, equal rights. Names several stories with similar/contrasting patterns.
Use Writing Skills	Uses few complete sentences. Uses subject/verb disagreements more than 50% of time. Has 6 or more misspellings. Uses vague, imprecise vocabulary: "The ending stinks," not "I wanted it to end because . . . "	Uses a few complete sentences. Uses subject/verb disagreements 30% to 40% of time. Contains 4 or 5 misspellings. Uses vague, imprecise vocabulary: "The ending rules," not "I liked the ending because . . . "	Uses complete sentences 50% to 60% of time. Uses subject/verb disagreements 15% to 30% of time. Has 2 or 3 misspellings. Uses more precise vocabulary: "The character was persistent," not "The character was way cool."	Uses complete sentences 70% to 90% of time. Uses subject/verb disagreements 5% to 10% of time. Has 1 or none misspellings. Chooses precise words consistently; describes events colorfully.	Uses complete sentences 90% of time. Uses correct subject/verb agreements almost always. Contains no misspellings. Chooses precise words consistently. Describes events/characters colorfully and vividly.
Sense and Ask Questions	Needs prompting to write any questions. Does not remember who, what, when, where, why.	Remembers who, what, when, where, why. Asks second/third-story questions only with prompting: "Is it better?" but not "How is it better?"	Uses five fingers to cue who, what, when, where, why. Asks some second-story questions: Compare this with. . ., Why do you think the character needed to . . . ?	Uses first-story answers to cue higher-level questions. Asks for analogy building. Asks for use of graphic organizers in answers.	Uses first-story answers to cue higher-level questions. Asks for analogy building and use of graphic organizers in answers. Digs out patterns, themes, attitudes, and values.

Figure 5.7

Each student will need a copy of the rubric for this performance learning task (see fig. 5.7) to monitor personal reading comprehension and to continuously evaluate and improve his or her people search. The teacher will work with students to help them become more skilled in asking second- and third-story questions and to ensure that they have a firm first-story base of facts upon which to build inferences and predictions.

The Coaching Context

Preview

The first people search review that students use will be created by the teacher. Before students read a story, the teacher will suggest they look for a theme and will give some examples: practice what you preach, finish what you start, explore new horizons, help friends in need. The teacher also may ask students to tie the theme or characters' actions to social values or beliefs—for example, integrity, loyalty, compassion, or equal justice. To ease assessment anxiety, the teacher will tell students that they will be doing an interactive, whole-class review of the story and will briefly describe the process: "I'll give you some questions about the story. You'll talk with classmates about the answers. Then we'll all discuss the answers. Finally, I'll ask each of you to individually reflect on what you read. I think you'll like this. I hope you'll have fun!"

Students will read the story individually. Then the teacher will give each student a copy of the people search review for the story and explain the people search procedure. After students do the people search and the class discusses the answers, each student will do an individual written review and reflection about the story (see fig. 5.8).

Jumanji Review and Reflections

Here's a quick summary of the story:

I think the theme is ______________ because ________________

What I liked best about the story is __________ because __________

What I'd like to see changed is __________ because ______________

The people search review helped me by ________________________

Figure 5.8

The Set-Up

After students do the teacher-written people search review, the teacher will distribute copies of the Three-Story Intellect diagram, and he and the students will analyze the level of each question. The teacher will explain the active reading assignment. Students will read a new story, and each student will write a people search review as he or she reads the story. Next, students will meet in small teams, compare their individually written people searches, and write a team composite on large paper. Each team will display its people search in a designated place in the room, and teams will do a gallery walk, moving from one people search to the next, noting which questions they like the best and their reasons for making those selections.

The whole class will discuss the questions and reach consensus on a people search review of the story. The teacher will assemble and make copies of the people search, and the students will do the people search review of the story. The students will ask another class to read the story, review it using their people search, and give them feedback about the effectiveness of the review and the quality of the questions. Finally, students will reflect on the experience and its impact on their reading comprehension.

Other Sources of Help

Some students may want to know more about reading for comprehension or other active reading strategies. The teacher can help students find websites that contain information and links to other sources of ideas. Some websites that were available at the time this book was written are

- http://www.marin.cc.ca.us/~don/Study/7read.html
- http://olympia.gse.uci.edu/Links/literacy.html#kids
- http://www.aability.com/rindex.html

A search engine will give many possible sites for the search terms "reading comprehension," "reading strategies," "improving reading skills," or other key phrases.

Doing the Task

The teacher may suggest that students begin the writing before they begin the reading by creating some first-story information-gathering questions. When they read any story, students will want to pay attention to characters and setting, including geographical details and time period. To summarize a story, students will want to remember key events and the order in which they occurred in the story. If students have their first-story questions written before they begin reading the story, they can collect their answers as they read. The teacher will assign the story, and students will write their people searches as they read.

After students have written their individual people searches for the new story, small teams of students will use the individual versions to prepare composite people searches. Each team will write its people search on chart paper and post the people search in a designated classroom location. Teams will do a gallery walk to read and discuss these people searches and compile suggestions for a whole-class people search. The teacher will facilitate a discussion during which students will reach consensus on this final version of the people search. The teacher will make a copy-ready master, photocopy it, give each student a copy, and direct the class review of the story.

Improving the Product

After the class has used the people search to review the story, small teams will reflect on the product and how they believe it could be improved. They may use Mrs. Potter's questions to guide the reflection.

- What were we asked to do?
- What did we do well?
- What would we do differently next time?
- What help do we need in improving this product?

The class will meet to discuss and approve revisions to the people search, and the teacher will produce a copy-ready master. The students will ask members of another class to read the story, use the people search to review the story, and give feedback about the effectiveness of the review process and the quality of the people search itself.

The Presentation

The students will invite students in another class to be the presentation audience. The students in the presentation class will outline the process of writing a people search and explain how becoming question askers helped them focus on the central issues and theme of the story. They also will describe how becoming the question askers helped them feel more confident and less threatened by the evaluation process. They may want to explain how these positive emotions and feelings of safety enhanced their content learning.

The students in the audience class will read the story, and the presentation class members will direct the use of the people search as a review tool. Following the review, each student in the audience class will provide feedback by answering a set of questions (see fig. 5.9).

People Search Feedback

Here's a short summary of the story and its theme:

Here's what I learned about the reading and questioning process:

A question that I still have about the process is

I'd give the questions on this people search a [check one]

___ thumbs up ___ thumbs sideways ___ thumbs down

because ________________________________

Figure 5.9

The Reflection

The presentation class students will review the feedback provided by students in the audience class. The teacher and students will discuss answers to the questions the audience class members had about the reading and the questioning process to clarify their own thinking about these ideas. They will examine the ratings of the people search questions and record this information on a large sheet of chart paper as a whole-class reflection. Students may refer to this whole-class reflection as they engage in question-asking assignments in the future. Each individual also will do a personal reflection using questions and sentence starters as a guide.

Recent research shows that reading for pleasure is an infrequent activity for most children and adults. One reason for this may be the stress that some students feel as they read without direction and with no definite idea of what they are expected to learn. By using a safe, low-risk, question-asking strategy to focus reading, teachers may help their students have more fun reading and may encourage reading for pleasure as a lifelong activity.

Reflection

WHOLE-CLASS REFLECTION

The Quality of Our Question Writing

What we're doing well is

What we want to improve is

Things we can do to improve are

Here are some sources of help:

INDIVIDUAL REFLECTION

My Understanding and Enjoyment of Reading

By asking questions about the story as I read it, I understood this story

☐ Worse than usual ☐ Same as usual ☐ Better than usual

By writing the test as I read the story, I felt

☐ Stressed ☐ OK ☐ Relaxed

I enjoyed this reading assignment

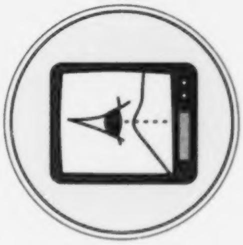
☐ Less than usual ☐ Same as usual ☐ More than usual

because

I hope we get to write the test when we read other stories because

PART II:

INTERMEDIATE PERFORMANCES



Chapter 6

"...To Form a More Perfect Classroom"

The Performance

Every social organization, whether it is a clan, state, government, society, or extended family, has a system of fundamental beliefs and rules under which it functions. This system of rules and principles, written or unwritten, is the constitution of the organization. Before students study the constitutions of the United States and their home state, they can experience the process of developing and writing a constitution. They will begin by identifying and formally stating the fundamental beliefs under which they want their classroom to function. Students then will write a classroom constitution that embodies and formalizes these ideals and principles. They will use this constitution to elect a legislative body that will write the laws under which the classroom will operate. Finally, students will improve their constitution by adding amendments that safeguard the rights of individuals or groups. As students study the writing of the constitution of the United States, they will learn that their classroom constitution-writing process parallels the steps used by the writers of the federal constitution.

Students will experience this performance learning task as an ongoing, evolutionary process. Each student will keep a journal in which he or she records personal insights about the steps involved in the creation of a written constitution, discussions or disagreements with other students, methods the class used to manage conflict and resolve disagreements, and reflections on how the constitution-writing process has helped the student clarify his or her beliefs about individual rights and responsibilities, social principles and ideals, and government functions.

For their final exhibition learning, small teams of students will present what they have learned about writing a constitution to other classes in the school. They will explain the process by which they developed their final product and describe their understanding of what a constitution is and what it does. To connect this performance to the world beyond the school, teams will show how their process parallels the writing and evolution of the U.S. Constitution. Audience members will give feedback by saying what they learned from the presentation and how this learning helps them understand the function and importance of a constitution to the efficient functioning of a society.

The Prompt

Students who do this performance learning task may have heard the term *constitution*, but they may not have a very clear understanding of what the word means. The teacher will give the class a definition, assign students to teams of four, and ask each team to brainstorm examples of written or unwritten constitutions and the groups they serve. Students may suggest that towns, states, and nations all have constitutions. They may not understand that clans, tribes, and families often operate under commonly accepted, unwritten systems of beliefs and rules that can be considered constitutions.

The teacher will suggest that a constitution helps a social group function more efficiently because the constitution establishes procedures and rules for frequently encountered situations. He will tell students that he wants them to understand the process of developing this kind of document because they live in a state and a country that have formal, written constitutions. He also will tell students that to become informed citizens, they will learn about the state and federal constitutions and the writing of the U.S. Constitution as they work toward a classroom constitution.

When he introduces the performance learning task, the teacher will describe the personal journal each student will keep, the steps in the constitution-development process, and the final presentation to another class in the school. The teacher will make arrangements for doing this presentation before students begin the performance learning task. Teacher and students will brainstorm the elements that are part of making a quality presentation, and the teacher will incorporate the results of the brainstorm into the rubric for the performance task (see fig. 6.2).

The teacher will give his students a list of the ideas they will discuss in the presentation.

- Steps in the constitution-development process
- Clarification of principles and beliefs underlying the constitution
- Function and role of the constitution in helping a social group function more efficiently
- Constitutional evolution and improvement over time

The Vision

Students will want to know how the leaders of a society agree on ideas and write a constitution. Several good books appropriate for different reading levels tell this story, and the teacher may want to have students read and discuss these books before they begin the performance task. Students can view the movie *1776* (which features the writing of the Declaration of Independence, not the Constitution, but the problems and disagreements in both situations were strikingly similar) for a musical look at the ways in which the writers of the Declaration of Independence overcame personal differences to establish a common vision of a nation. The teacher also may share with his students excerpts from the diaries of the writers of the U.S. Constitution and ask students to comment on what they learn from these passages. Students may be surprised to learn that the country's founding fathers did not always agree with each other and that they often did not particularly like each other, and yet they still found ways to agree on the best course for the country.

The teacher also will tell students that the writers of the U.S. Constitution knew they had created an imperfect document and that, before the original Constitution was ratified, the first ten amendments were envisioned. He can give students a list of the amendments, the dates of their ratification, and their purposes to show that, at its best, a constitution is an evolving, changing document that reflects the ideals and attitudes of the society that produces it.

The Standards

As students do this performance learning task, they will be learning about the historical development of the U.S. Constitution and their state's constitution and writing a constitution for use in their own classroom. They will want to take some care in weaving together the threads of their learning to form some key concepts: what a constitution is, what it does, and how the beliefs of a society determine the contents of its constitution and its form of government.

Early in the performance learning task, the teacher will give each student a copy of the task development chart (see fig. 6.1). Using the task development chart will help students appreciate what they have learned and what they can do well, and will assist them as they look for ways to improve their performance and become more adept constitutional scholars.

The performance rubric (see fig. 6.2) for this task indicates its separate threads. Students will demonstrate their understanding of constitutional concepts they have learned through participating in the process of identifying their core beliefs and deciding what form of government and what laws are appropriate for their classroom society. Their journals will be key tools in processing their knowledge, and their preparation for the performance presentation will help them review what they have learned and clarify the concepts in their own minds. Students can self-evaluate the quality of their learning and preparation for the final performance using the task rubric, and this self-evaluation can lead to higher quality presentations and the formation of deeper understandings and more complex concepts.

Task Development Chart: ". . . To Form a More Perfect Classroom"

Performance Tasks	Developmental Levels	Curriculum Standards
Brainstorm: • What are our core beliefs and principles? • Rights and responsibilities of individuals? • "Rule of law"? • What is a constitution? Form this concept. • Must it be a written document?	***Novice*** Unaware of personal beliefs or system of principles. Vaguely aware of government as "them." Cannot define "constitution." Gives no examples of written/unwritten constitutions. Displays no conflict management/consensus skills: "My way or the highway!"	***Social Studies*** Identify fundamental beliefs for social organizations: respect for others, individual rights and responsibilities, fairness, equity, justice. Recognize role of laws in effective functioning of society: to promote common good and maintain order and security. Explain key ideals of representative democracy: individual dignity, liberty, justice, rule of law. Trace historic origins of social principles and ideals. Show how constitutions change over time with interpretation and amendment.
Decide on format for the constitution (use Internet resources). Small Teams: Draft assigned sections. Whole Class: Discuss, debate, reach consensus. Assemble and adopt the constitution. Elect team representatives to House of Representatives.	***Advanced Beginner*** Quotes "golden rule" or other memorized statement of beliefs/principles. Names some local elected officials. Knows a constitution has something to do with laws. Knows about written constitutions. Listens to differing points of view without agreeing.	***Language Arts*** Read about writing a constitution and summarize reading selections. Write constitution and amendments demonstrating precise use of vocabulary and writing conventions. Speak persuasively. Listen with focus; summarize, paraphrase, ask speaker for clarification.
Whole Class: Operate under rules of constitution. Identify unclear areas. Test amendment procedures: representatives draft an amendment, take back to teams, teams vote to adopt or kill amendment.	***Competent User*** States core beliefs in own language. Names local officials, governor, and U.S. president. Knows separation of powers and Bill of Rights. Gives examples of unwritten constitutions. Listens to/may agree with different viewpoints.	***Mathematics*** Solve ratio/proportion calculations to determine number of representatives each team can send to the legislative house. Calculate this for legislative houses of varying sizes to determine ideal size to use for the class.
Record insights about the process and key interactions with classmates, differences and disagreements, means of reaching consensus, beliefs about role of government and rights of individuals.	***Proficient Performer*** Discusses core beliefs and principles. Knows names of many local, state, and national elected officials. Explains powers of executive, judicial, and legislative branches and applies to clans, tribes, and families. Demonstrates consensus-reaching skills.	***Library Media and Technology*** Find print materials that are good sources of information. Locate websites that provide helpful information. Evaluate information sources for accuracy and helpfulness. Communicate with national senators, congressional representative, and other elected officials at <http://www.congress.org/main.html>.
Research writing of state and federal constitutions and their key points. Communicate results of constitution-writing experience and study of historical events to another class.	***Expert*** Discusses core beliefs and principles and need for laws. Communicates with elected officials to make views known. Gives examples of executive, judicial, and legislative actions. Gives detailed explanations of unwritten constitutions. Helps others learn consensus-reaching skills.	

Figure 6.1

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Performance Rubric: " . . . To Form a More Perfect Classroom"

Developmental Level Performance	Chaos	Confusion	Calm	Cooperation	Coordination
Develop a Model of Democracy	Survival of the strongest. No laws or rules. "Every man for himself." Little trust or respect.	Rule by the strongest. Rules serve the strongest. One king and many peasants; little trust or respect between ruler and ruled.	Cooperation among members of society. Unwritten rules protect everyone. Oversees group compliance with rules.	Elected leaders. Written rules based on common beliefs. Much duplication of functions of society.	Elected leaders have special roles or functions. Written rules based on common beliefs. System constantly evolves.
Participate in the Process	Monopolizes discussion time. Does not attempt to see others' points of view; argues, becomes angry. Does only what he or she wants; displays no teamwork skills.	Bosses others in the team. Meets disagreement with sarcasm and criticism. Assigns all of the work to others.	Takes turns during discussions. Listens when others disagree; seldom accepts others' point of view. Does his or her share of the work.	Rotates leadership with teammates. Listens, paraphrases, asks for clarification; will change mind. Knows team sinks or swims together.	Nominates others for leadership. Enjoys seeing different points of view. Accepts ideas of others. Displays skill at team give-and-take.
Write a Constitutional Journal	Writes few entries; most days missing. Focuses on gossip and personality conflicts. Does not reflect on beliefs, process, concepts.	Writes entries for at least 50% of days. Focuses on "what I did"; lists activities and actions. Does not reflect on beliefs, process, concepts.	Write entries for at least 80% of days. Gives some insights into the process; describes concepts. Notes interactions, conflicts, discussions with humor.	Writes entries for most days. Shows insight into concepts and classmates. Reflects on beliefs, rights, government roles. Notes interactions with insight and humor.	Writes entries for most days. Shows deep understanding of classmates and concepts; very reflective on beliefs, rights, and government role. Provides good commentary on conflict management and reaching consensus.
Understand the Process	Displays no insight. Thinks a constitution just happens. Cannot explain or repeat steps independently.	Sees a little of it. Knows that ideals and laws are connected somehow. Doesn't bridge to the written document.	Sees how ideals and principles bridge to laws. Doesn't see evolution of society as laws are tested. Remembers to start with ideals and then write.	Understands that laws are rooted in ideals. Knows laws can change over time. Does not see the ongoing cycle.	Shows clear vision of ongoing cycle: principles to drafting to testing to amending to aligning with principles and so on. Understands that strong governments constantly evolve.
Participate in Presentation	Hangs head. Mumbles. Does not invite audience participation. Uses no visuals.	Uses adequate volume. Reads from a script. Doesn't look up. Does not interact with audience. "Talking head."	Uses adequate volume, some inflection. Presents script as if memorized. Waits for audience to laugh at jokes. Acts rehearsed.	Uses good volume and inflection. Consults notes occasionally. Invites questions from audience; answers clearly. Acts as a teacher.	Uses good volume, tone, and inflection. Uses brief notes to keep on track. Does think-pair-share, etc. Honors ideas of audience. Acts as a facilitator.

Figure 6.2

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The Coaching Context

Gathering Start-Up Information

The teacher and students will use several information-gathering strategies simultaneously during the early phase of this performance learning task. The teacher will assign students to teams of four and ask them to divide team roles. The speaker will be the leader who keeps the team focused, on task, and on time; the clerk will record notes from the team discussions, be ready to read them back during follow-up discussions, and do rough drafts of the constitutional article and any subsequent amendments the team writes; the whip will serve as a liaison with other teams, asking their opinions about the constitutional article the team is writing and reporting back to his or her team; and the parliamentarian will suggest strategies for managing conflict with other teams or reaching consensus within the team.

The teacher will use a combination of print, video, and online resources to help students acquire valuable background for the performance task. The teacher may choose to have the entire class read the same book or have different teams read different works and summarize them for the class. Young readers will find a variety of books on this topic such as *We the People* (Spier 1991) and *Shhh! We're Writing the Constitution* (Fritz and dePaola 1987). After watching sections of *1776*, the teacher and students can list techniques for defusing conflicts and reaching consensus and post them on a chart in the room (see fig. 6.3).

Conflict-Defusing and Consensus-Reaching Techniques

We can manage conflict and reach consensus by . . .

- Letting the speaker finish.
- Paraphrasing what the speaker has said (instead of contradicting).
- Finding ways to say "and" instead of "or" or "but."
- Saying, "Tell me what you know that I don't."
- Using "I" statements (e.g., I perceive, I think, I could, I want).
- Avoiding "you" statements (e.g., you think, you could, you know).
- Letting everyone who wants a say have one.
- Speaking pleasantly and politely.
- Taking time to reflect before voting.
- Agreeing to abide by the majority vote.

Figure 6.3

A number of Internet websites contain valuable pointers about the process of writing a constitution. At the time of this writing, these websites include

- http://www.law.cornell.edu/constitution/constitution.overview.html
- http://www.columbia.edu/cu/gssc/About_Council/Constitution/constitution.html
- http://dolphin.upenn.edu/~oslaf/writecon.html

Students can find a format for a constitution at <http://www.cips.ca/sections/student_constitution.htm>.

Students may modify this format to fit their needs. The format suggests that a good constitution for a student organization will give the name of the organization, membership requirements, election of officers, powers, duties, qualifications of officers, and so on. Students may decide they want to write separate articles dividing powers among branches of government and detailing ratification and amendment procedures. They may decide they want their constitution to include a preamble. The teacher can supplement any format that students find on the Internet with suggestions and examples of the formats of the federal and state constitutions. The U.S. Constitution is available online at <http://www.history.org/life/politics/constitu.htm>.

Before the class begins writing a constitution, one important decision it might make is whether the whole class will serve as the legislature or whether students want to use proportional representation to elect members to a House of Representatives. The teacher can use this discussion to introduce the idea that, in a system of proportional representation, the number of representatives to which a state is entitled depends on its population, and this is why having accurate procedures for taking a population count (census) is so important. The teacher and students may want to do some sample calculations for a "House of Representatives" for their school. If the school serves 150 students, the class may decide that the legislature will consist of 15 representatives. The teacher can give the students information similar to that shown in figure 6.4 and ask them to fill in the missing numbers.

Brainstorming Principles, Beliefs, and Rules

Whether a constitution is written or informal, it is a compact that is grounded in the principles and beliefs of the social organization it serves. The teacher will explain this idea to his students and give examples of the principles that the writers of the U.S. Constitution wanted to embed in the federal constitution: individual dignity, liberty, justice, fairness, equity, and the rule of law.

Teacher	Number of Students in Class	Number of Representatives
Mr. Williams	30	
Ms. Burke	30	
Ms. Fogarty	20	
Mr. Bellanca	20	
Ms. Ward	30	
Ms. Schumer	20	

Figure 6.4

The teacher then will ask students to individually develop a list of four or five personal beliefs they would like to use as the foundation of the classroom constitution. The teacher will encourage students to discuss this at home so that family members are aware of what the class is doing and have a chance to discuss their beliefs with the students. As the class develops a list of principles and beliefs, students will produce a poster of these principles and beliefs for permanent classroom display (see fig. 6.5).

Our Classroom Principles

- We believe we all have equal rights in this classroom.
- We believe we all have the responsibility to help each other.
- We believe in treating each other respectfully.
- We believe in following the rules to keep our classroom working effectively.
- We believe in taking our fair turn.

Figure 6.5

Writing the Constitution

Once the members of the class have adopted their statement of beliefs, they will be ready to begin writing the classroom constitution. The teacher will divide the writing task so that each team works on a specific section or article of the constitution. Areas of responsibility could be as follows.

Team 1: The preamble and name of the social organization

Team 2: Legislative membership requirements, election of members, and powers

Team 3: Executive officer qualifications, election, and duties

Team 4: Judicial officer qualifications, election or appointment, and duties

Team 5: Powers, rights, and responsibilities of classroom teams

Team 6: Amendment procedures

Team 7: Ratification procedures

Each team will write a draft of its constitutional article, and the whole class will discuss the drafts, ask for clarification, and suggest changes. Teams will revise their sections of the classroom constitution, and the whole class will meet again to approve the refined constitutional articles. Each team will give the teacher a copy of its article on computer disk so that the teacher can quickly assemble the constitution and print copies for everyone in the class. Each student will receive an additional copy to take home to share with his or her family.

Testing the Constitution

Each team will discuss the finalized constitution and vote on whether or not to accept it. If the number of teams needed to ratify the constitution votes to do so, the constitution will become the official statement of the system of government to be used in the classroom. If the constitution fails this ratification test, the teacher and class will discuss the reasons why. If the concern is about pieces that seem to be missing, the teacher could suggest that the class follow the example of the colonies in ratifying the federal constitution: adopt the present document with the understanding that teams will write amendments to fill in the missing pieces as soon as the existing document is ratified. If some teams still have concerns about the wording or clarity of separate articles, the constitution will undergo another round of revision. The teacher will encourage students to produce a constitution that is ratified as quickly as possible.

Using the Constitution

As soon as the constitution is ratified, the class will hold elections. Teams may have decided that the class as a whole will act as the legislative body or they may have decided to have a representative legislature. If the latter is the case, each team will elect its legislative representative. The legislature will elect leaders who will facilitate its functioning and make committee assignments (writing teams will serve as legislative committees). The class will elect executive leaders who will appoint, with the consent of the legis-

lature, a supreme court. The legislature will draft classroom rules. The class will use constitutional processes to promote effective day-to-day functioning of the social organization.

At this point, the teacher will focus the students' attention on the Bill of Rights, the first ten amendments to the federal constitution, and ask, "What specific rights might we want to define for members of this classroom that are not well defined in our present constitution?" The teacher and students will brainstorm a list of rights, including such rights as those relating to physical safety, respect, courtesy, privacy, inclusion, learning, and making restitution.

Each team will draft an amendment to the constitution that focuses on one of these rights as assigned by the legislative leadership. Teams then will distribute copies of the proposed amendments and lobby for their passage. The legislative leaders may decide to have teams vote on all of the amendments on the same day or they may schedule different ratification dates for each of the amendments. The teacher, acting as an advisor, will encourage the students to complete the amendment process in a timely manner.

Keeping a Constitutional Journal

As students complete the constitution and ratify and test the document, they will keep individual personal journals of observations and reflections. When the teacher makes this assignment, he can read aloud portions of the journals of the men who drafted the U.S. Constitution. As students hear the observations and insights of the writers of the federal constitution, they will gain insight into the founding of the country and receive a model of the journaling process.

The teacher will encourage students to focus journal entries on the key interactions they have with others in the class and observe the methods they or classmates used to maintain a courteous process and reach consensus, beliefs about the rights of individuals and the role of government in defending those rights, insights into how the rule of law promotes effective functioning of social organizations, and understanding of the feedback system that societies use to develop and change their constitutions. A sample format for journal entries is shown in figure 6.6.

The Presentation

Each team in the class will do a presentation performance for another class in the school. The presentation team will tell the audience what a constitution is, explain why this concept is important for students to learn, and focus on the process of developing a constitution. Each audience member will receive a copy of the classroom constitution with the graphic showing the feedback system that represents the ongoing evolution of a constitutional government (see fig. 6.7). The teacher will make a blackline master of this feedback loop and make copies for teams to distribute to the audience members.

Constitutional Journal

Date:

Events and actions:

Interactions with peers:

Agreements	Disagreements	How we reached agreement

Growth of our constitution:

How this reflects our beliefs:

Figure 6.6

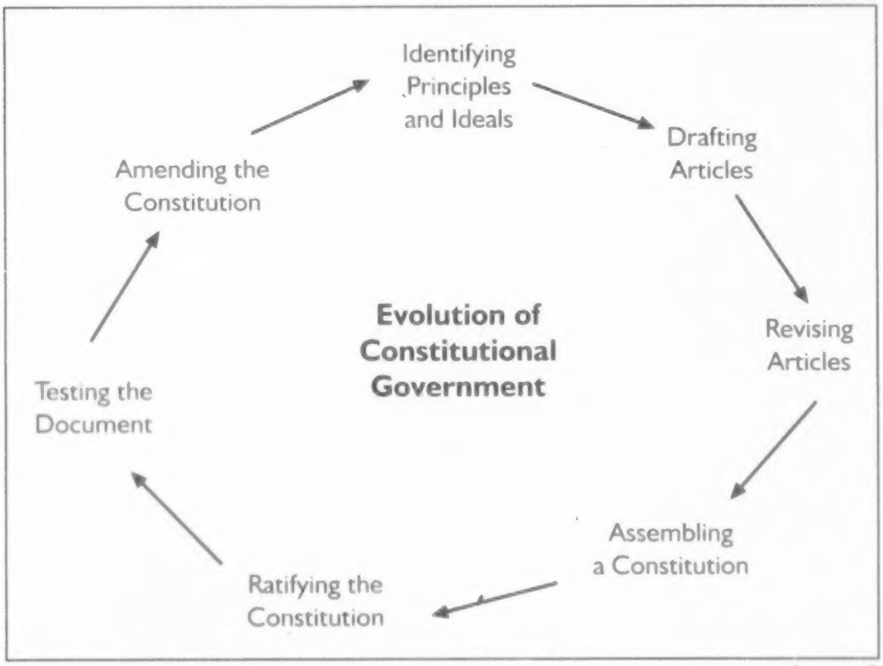
Identifying Principles and Ideals
Drafting Articles
Revising Articles
Assembling a Constitution
Ratifying the Constitution
Testing the Document
Amending the Constitution
Evolution of Constitutional Government

Figure 6.7

The presenting team may want to help the audience experience some of the constitution-development process by having partners brainstorm beliefs and ideals, practice the skills involved in listening to understand, or speak to persuade each other of a point of view. At the conclusion of the presentation, the presenting team will ask audience class members to brainstorm their own conceptual definitions of what a constitution is to share with the rest of the group. This redefining activity will help the presenting team appreciate the success of its teaching.

The audience class members will write notes to the presenting team telling what they learned from the presentation performance. The presenting team will read these notes to be sure the audience class learned the information accurately. If the audience formed some misconceptions, the presenting team will write notes in reply and reinforce the correct information.

The Reflection

Because this performance learning task is the only experience that most students will ever have with writing a constitution, the students and teacher will want to process and reflect to make the learning more permanent. Each student will begin by lifting his or her learning to a new level with a reflective log entry based on the acronym LIFT.

Members of constitution-writing teams will discuss their journal entries with each other, and each team will make a master list of learnings that it will share with the whole class. The class will categorize the learnings into two categories: what we learned about the concept of constitution and what we learned about the constitution-writing process.

The teacher will record these learnings on a large sheet of chart paper and post it in the room for several weeks to help students remember their production of the classroom constitution.

The students and teacher will use the constitution to promote effective functioning of the classroom for the rest of the year. Whenever a procedural or rules problem arises, the teacher and students will examine the constitution and classroom rules passed by the legislature to see if the solution is suggested by the existing documents, if the class wants a new rule, or if the class wants to try to amend the constitution. This ongoing use of the classroom constitution will reinforce the concept that such a system of principles and laws constantly evolves through use, interpretation, and amendment.

Reflection

INDIVIDUAL REFLECTION

Journal Entry

L What did I **L**earn?

I Why is the learning **I**mportant?

F How can I **F**ile it?

T What will **T**ransfer? Where and how?

TEAM REFLECTION

What We Learned About Constitutions

The Concept	The Process

Chapter 7

Cruising the Cortex: Sightseeing for Smarts

The Performance

Students learn how to use written language effectively and expressively by actually engaging in writing. In this performance learning task, student teams will write scripts for infomercials that teach key ideas about the eight multiple intelligences identified by Howard Gardner (1983) and emotional intelligence as described by Daniel Goleman (1995). Each infomercial will feature a definition of the intelligence, examples of using the intelligence in everyday life, and an audience-participation activity that immerses the learners in using the intelligence.

The teacher will divide the class into nine teams. She will assign one of the multiple intelligences or emotional intelligence as the focus for each team's infomercial. Each team will plan and write a script and perform the script for the rest of the class. As the team writes, each member will analyze the script for precise vocabulary choices, consistent point of view, and smooth transitions between sections.

Each writing team will present information about its intelligence to an audience, coach the audience members through the intelligence-using experience, and ask each audience member to write a reflection about how this experiential learning enriched and deepened his or her understanding of the targeted intelligence. Performance learning will occur on several levels for the writers and audience.

The team members will improve their use of written language as they write, edit, and/or refine the script. They will learn to identify and avoid ambiguous constructions and become more adept at using precise language to convey important ideas. Some intelligence theorists believe that the development of complex language, especially syntax, is a key factor in the development of many intelligences (Calvin 1996). As students polish their use of language, they are strengthening the kinds of structured sequence skills involved in activities such as getting out of bed, listening to Mozart, or selecting a brand of toothpaste. Calvin suggests that strengthening one skill that involves novel agendas and sequences may strengthen all of these skills. Both the writers and the audience will deepen their understanding of different intelligences by using each "way of knowing" in context. Because the learning is contextual and has some personal meaning, it will be stored as episodic memory and the brain will recall and use this learning effortlessly (Sylwester 1995).

The Prompt

If the students have no prior knowledge of the multiple intelligences and emotional intelligence, the teacher will want to introduce students to these ideas. She may give working definitions of the intelligences so that students know what kinds of activities demonstrate what ways of knowing. The teacher may structure activities to introduce these intelligences to the students. She may have students do intelligence inventories—either an emotional intelligence or a multiple intelligences inventory, or both—and she will emphasize the idea that intelligence profiles can and do change throughout our lifetimes. The teacher will suggest that students file these intelligence inventories in their journals so that they can track their growth over the course of the school year.

One good source for intelligence inventories is Armstrong's *Multiple Intelligences in the Classroom* (1994). Students and teacher also can find many websites with good information about the intelligences. Some of these sites include intelligence inventories, score the inventories, and report the results to the person doing the exercise. Information on multiple intelligences and emotional intelligence is available at the following websites:

- http://www.newhorizons.org/rech_mi.html
- http://real.org/know/interactive.htm (includes an intelligence inventory)
- http://www.scbe.on.ca/mit/mi.htm
- http://homearts.com:80/depts/relat/01eqqab5.htm (includes an emotional intelligence test)
- http://hobart.southcom.com.au/~rex_stoessiger/eq.html

To set up the writing task, the teacher will ask students, "Do you know what an infomercial is? What are one or two examples of infomercials?" Students will brainstorm answers using the think-pair-share strategy. The teacher will collect sample answers and list them on the chalkboard. Next, she will explain to the students that they will be working in small teams and that each team will write and present an infomercial to teach the rest of the class about one of the intelligences.

The teacher will tell her students that the targeted writing skills for the assignment are precise use of language, consistent point of view, and smooth, clear transitions. The teacher and students will analyze writing samples that show varying levels of skills. Students will need to know what poor use looks and sounds like, and they will need examples of excellence.

The teacher will assign students to small working teams and tell them that each team will have a producer who keeps the team focused and on task and who is responsible for assembling props and making special materials, a dialogue coach who polishes the infomercial script the group writes and produces a clean copy of the final script, and a director who sets up the action for the infomercial and divides the speaking lines equally among the teammates. After teams have had time to do a trust-building activity and decide who will do each role, the teacher will explain the presentation performance.

Each team presentation will include a brief introduction to its intelligence, focusing on its key attributes. For example, the emotional intelligence team may focus on self-awareness, managing emotions and mood, impulse control, and/or empathy. The bodily/kinesthetic team may emphasize physical coordination, timing, and a preference for hands-on learning. Each team will identify activities that show its intelligence in action and will give examples of typical career choices for people who are comfortable working through this intelligence.

Then the team will set up an active learning experience in which audience members reinforce their learning by working in the targeted intelligence. The musical/rhythmic team could divide the audience into small teams and ask each team to rewrite a nursery rhyme explaining musical/rhythmic intelligence. The logical/mathematical team could have groups of audience members solve logic puzzles or play number games.

Each presentation will end with every member of the audience writing a personal definition of the targeted intelligence, giving an example of using this intelligence in his or her personal life, identifying one adult who he or she believes is strong in this intelligence, and explaining what the adult does that demonstrates this strength. The master script outline for all teams is shown in figure 7.1.

Intelligence Infomercial Outline

Introduce and give a brief working definition of the intelligence.

Identify and describe the key attributes of this intelligence.

Give examples of career choices that target this intelligence.

Direct an activity to experience the intelligence.

Ask for reflections: personal definition, personal example, and adult example.

Figure 7.1

The Vision

Students may be quite familiar with infomercials. The teacher will show a video featuring several recent clips from television. Paid programming often is scheduled for weekend mornings or late evenings. The teacher may ask the school media specialist to help her record examples and produce an edited tape that demonstrates the key features of these infomercials. These programs usually include an introduction of a product or service, an explanation of what the product or service can do for members of the audience, a demonstration that may include audience participation, and testimonials about how use of the product has improved the life of someone who uses it regularly. Some programs use a hard-sell approach. Others demonstrate the product or service casually and include much friendly banter between the host and the audience.

The teacher may ask the students, "What features of these commercially used programs do you like? What do you want to use in your infomercial? How hard do you want to sell your intelligence? Do you want to do a straightforward presentation or do you want to parody one of these salespeople?" In asking these questions, the teacher is suggesting that students carefully analyze what they see so they can have fun producing a quality program. At this time, teacher and students will review the results of their analysis of writing samples. They may want to develop a T-chart such as the one shown in figure 7.2 listing examples of strong and weak use of the writing skill.

Precise Use of Vocabulary

Good Examples	Poor Examples
At least eight out of ten	Most of them
Conclusion inconsistent with the facts	A poor idea
So excited that I began to hyperventilate	Totally happy

Figure 7.2

The Standards

Student teams will begin this performance learning task by researching their assigned intelligences. They will write and rehearse their performance presentations, present their infomercials to their classmates, and reflect on their presentation and learning. The tasks they will be doing and the developmental levels for this performance are outlined in the task development chart (see fig. 7.3).

Teams will want their infomercials to teach correct information, engage the interest of their classmates, and help their classmates practice using the targeted intelligence. In order to do a quality presentation performance, teams will use the performance rubric (see fig. 7.4) to evaluate their infomercial during each step of preparation. The rubric will help them determine what is strong about the performance and what still needs strengthening. It can be a tool that they can use as they implement the process of kaizen in this performance learning task.

The Coaching Context

Researching the Intelligence

As students gather information about the intelligences, the teacher can help them find helpful and age-appropriate sources. The teacher may have a classroom library with good materials on multiple intelligences and emotional intelligence or students may search for materials in the school library. The Internet is a rich source of information on these topics. Students will be able to get their information fairly quickly with a little help and guidance from the teacher. The teacher also will have writing style manuals, samples of scripts from former student projects, and scripts from one-act plays available for students to read and analyze.

Each student will write a practice script and use the performance rubric to analyze their writing for the targeted skills. They may ask for feedback from the teacher or other students as they warm up their writing muscles.

Developing the Script

As its members collect information, each team will write its own definition of the assigned intelligence and gather examples of the intelligence in action. The team will use this information to brainstorm a script for its infomercial. The dialogue coach will produce a copy of the rough script for each team member, and the team will read through the script and make preliminary changes to correct the most obvious weaknesses. Each member will then take the rough script home and do an individual revision. The team will meet, discuss these individual versions, and draft and approve a final team version. The dialogue coach will check this script for word choice, consistent point of view, and smooth transitions, make necessary corrections, and produce a clean copy of the script for each team member. The team will proofread the script and make any final alterations that members agree will strengthen it.

The director will ask team members to brainstorm a list of props and materials the audience will need to do the intelligence-targeting activity. The whole team can decide which teammates will provide each of the various items on the list. The teacher may be able to help with some audience materials, such as paper and markers for making visuals, and the teacher

Task Development Chart: Cruising the Cortex: Sightseeing for Smarts

Performance Tasks	Developmental Levels	Curriculum Standards
Meet teammates, distribute roles, receive intelligence assignment. Collect information about the assigned intelligence. Do an intelligence description. Collect ideas or suggestions for activities that target the intelligence.	***Novice*** Thinks intelligence is a single, fixed brain quantity. Cannot give a working definition of intelligence. Sees no connection between experiences and learning. Unaware of personal comfort and discomfort; thinks any problem with school is because "it's dumb, it's boring, I don't like it."	***Language Arts*** Use information to form questions and support predictions. Summarize information and apply it to personal insight. Produce a script that shows clear understanding of concepts. Edit and revise for word choice, consistent point of view, and smooth transitions.
Brainstorm the infomercial script. Produce the rough draft. Select an intelligence-targeting activity. Try it out as a team; evaluate its effectiveness. Polish the script.	***Advanced Beginner*** Can give a somewhat jumbled definition of intelligence. Thinks intelligence is inherited and fixed. Connects strong members with the learning contexts. Can identify personal learning context preferences (e.g., music, quiet; at desk, on bed; alone, with a buddy).	***Fine Arts*** Use elements of acting, directing, and writing to communicate with an audience. Use body, mind, voice, costumes, props, and other tools to teach the assigned intelligence.
Rehearse the script. Produce visuals, assemble props, produce audience materials. Practice the activity with buddy teams; get feedback, revise, and rehearse again.	***Competent User*** Recognizes importance of experiences to learning and intelligence growth. Understands that people are smart in different ways. Knows that different people learn in different ways. Can explain and demonstrate this knowledge to others.	***Physical Development and Health*** Respect peers regardless of individual differences (in intelligence comfort zones). Recognize and respect the opinions and feelings of others.
Brainstorm the infomercial script. Produce the rough draft. Select an intelligence-targeting activity. Try it out as a team; evaluate its effectiveness. Polish the script.	***Proficient Performer*** Recognizes importance of experience and emotion to learning and intelligence. Can name and explain different ways of being smart. Recognizes "kind of smart" targeted by different learning activities. Explains and demonstrates this knowledge to others. Tracks personal intelligence profile.	***Social Studies*** Explore how personal intelligence comforts influence personal interests and perceptions. Identify ways in which cultural emphasis on some intelligences contributes to people's attitudes and perceptions.
Do the intelligence presentation. Do the activity with the whole class. Reflect on the process and the presentation performance. Do a personal intelligence profile. (Throughout the year, identify targeted intelligences for different activities. Track changes in personal profile; focus on increased comfort and strengths in intelligences.)	***Expert*** Recognizes role of experience and emotion in learning and can cite research base. Can name, explain, and demonstrate different ways of being smart. Facilitates learning of others. Tracks personal intelligence profile and targets intelligences to strengthen.	***Science*** Recognize that a theory is a tentative explanation of data that may change over time.

Figure 7.3

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Performance Rubric: Cruising the Cortex: Sightseeing for Smarts

Developmental Level / Performance	Seed	Sprout	Sapling	Tree	Forest
Know Theories	Remembers taking an IQ test. Thinks intelligence is a fixed, single, inherited feature. Demonstrates no knowledge of history or meaning.	Has vague ideas about intelligence and "talents." Thinks intelligence is fixed and inherited. May know some names, e.g., Gardner, Goleman.	Names multiple intelligences. Believes that intelligence is nurture and nature. Correctly associates researchers' names with theories.*	Names and defines emotional intelligence and multiple intelligences. Believes that intelligence follows "use it or lose it" and genetics. Has read articles and/or books about theories.	Demonstrates emotional intelligence and multiple intelligences. Explains how to strengthen multiple intelligences. Has read and can discuss original writings by Gardner and Goleman.
Apply Theories to Self	May know personal IQ as measured by Stanford-Binet test. Demonstrates no knowledge of history or meaning of this score. Displays no real understanding of intelligent behavior.	Has done a multiple intelligences inventory activity. May remember highest comfort areas. Knows implications of Stanford-Binet IQ scores. Knows "smart people's heads talk to themselves."	Identifies high and low comfort multiple intelligences. Knows comfort can grow. Works in low comfort area if asked to. Uses reflective or self-monitoring techniques when asked to.	Recognizes growth in comfort over time. Reflects and self-monitors without reminders. Transfers with some effort and prompting.	Describes growth in comfort with multiple intelligences and emotional intelligence. Reflects, self-monitors, and self-corrects effortlessly. Transfers automatically and easily. Targets areas of discomfort for future growth.
Demonstrate Writing Skills	Uses imprecise words. Gives a disjointed, jerky narrative. Writes with few details and/or redundancies. Spells and punctuates incorrectly; doesn't correct.	Uses generalized words and phrases: a lot, not many, "dumb idea," etc. Uses some jumpy transitions. Gives a few supporting details. Uses a few spelling or punctuation errors.	Uses precise vocabulary most of the time. Uses abrupt transitions. Makes a few mechanical errors. Supports and illustrates majority of main points well.	Uses precise, colorful phrasing and vocabulary. Makes no mechanical errors. Uses abrupt transitions. Illustrates and supports most main points well.	Uses Academy Award–winning script! Chooses clear, vivid vocabulary. Makes smooth transitions. Makes no mechanical errors. Illustrates and supports all main points clearly.
Participate in Presentation	Uses an inaudible voice. Makes no eye contact. Keeps eyes glued to the script. Shuffles feet. Coughs or clears throats every other word. Displays major stage fright.	Uses audible volume. Speaks in a monotone. Glances up from script every few minutes. Coughs only 3 or 4 times. Stands stiff, uses no gestures. Acts scared stiff.	Uses audible voice. Uses good inflection and changes in volume. Checks place in script occasionally; maintains eye contact with audience. Uses some semirelaxed, natural gestures.	Uses good volume and inflection. Prompts teammates so they don't need to use scripts. Uses easy, natural gestures. Acts relaxed, smiles.	Uses clear, expressive voice. Ad-libs to convey the intent of the script. Prompts well and demonstrates teamwork. Acts natural, relaxed; smiles, is having fun. Puts on an Oscar-winning performance.
Facilitate Learning	Fails to communicate to audience when to participate or what to do. Displays "pour and store" (learns by listening). Lectures with no learning checks. Puts audience to sleep.	Communicates to audience when to participate but not how. Makes an attempt at interaction. Presents short bursts of "learner activity." Refers to processing but states, "We don't have time."	Repeats activity instructions only once. Leaves learners on their own to do the activity. Provides at least as much activity time as lecture. Processes quickly: what we did well.	Gives clear activity instructions. Acts as a "teacher," monitors and assists learners. Majority of the presentation is activity. Processes well: what we learned, what we did well.	Reinforces instructions with overhead or flipchart. Acts as a teacher; monitors and helps as needed. Weaves activity and lecture into one piece. Processes completely: what we learned, did well, want to improve.

Figure 7.4

* **Editor's Note:** Daniel Goleman is the author of the well-known book *Emotional Intelligence*. This book is based on the theory developed by researchers Peter Salovey of Yale University and John Mayer of New Hampshire University.

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will reserve a site in the classroom where each team can assemble and store its props and supplies. This site could be a large box, a section of countertop, or a shelf on a rolling cart.

At the beginning of the performance learning task, the teacher will announce the due date for the completed scripts. Teams may make small adjustments and changes to the script after this date, but the main script elements will be finalized by the due date.

Rehearsing the Infomercial

Once the team has a production-quality script, the director will assign each person his or her lines, making sure that the speaking parts are equally distributed among all team members. The team may prepare visuals to accompany its presentation. Team members may decide, for example, to make a T-chart telling how their intelligence looks and sounds in action (see fig. 7.5).

Intrapersonal Intelligence

Looks Like	***Sounds Like***
Writing in a journal	I like this because . . .
Choosing to take a walk alone (to think and reflect)	I need some time to think about . . .
Using a rubric to self-evaluate	This is the strategy I used when I . . .
Putting together a portfolio to document learning	These pieces represent my learning journey best because . . .

Figure 7.5

Each team will assemble the necessary props, the costumes, and the materials for the intelligence-targeting activity. The teacher will assign three teams to be a practice triad so that each team can rehearse its intelligence-targeting activity with a small audience to fine-tune its facilitation of the activity. The team that developed the activity will ask the triad teams to give feedback by responding to several statements (see fig. 7.6).

Triad teams will have at least two chances to work together before the final infomercial presentations, allowing each intelligence team the opportunity to test its activity, revise and refine it, and repeat the test run to get feedback about the effectiveness of the changes.

Rehearsal Feedback

- The intelligence we were experiencing in this activity is
- The activity asked us to use the intelligence by
- We felt [select one]
  - — immersed in the intelligence
  - — connected to the intelligence
  - — viewers of the intelligence
  - — unaware of the intelligence

  because ____________________________________
- Our suggestions for strengthening the activity for the whole-class presentation are

Figure 7.6

Scheduling the Presentations

The teacher may want different teams to present their intelligences on different days. She may determine the presentation order herself or she may have teams draw numbers to decide the presentation order. Teacher and students will discuss the presentation schedule, and the teacher will give each student a copy of the presentation schedule. She may encourage students to invite their parents to come to class to participate in the presentations. The teacher and students may decide that they want to invite other classes or the school administrators to come for the performances. By enlarging the audience, the teacher and students can enhance the authenticity of this presentation performance.

The Presentation

When an intelligence team takes the stage to begin its presentation performance, team members will begin by defining the intelligence by demonstrating some observable, intelligence-associated behaviors. The verbal/linguistic team might appear with one member reading aloud, a second writing in a journal, and a third practicing a speech. The emotional intelligence team could enter with one member saying to herself, "Now just calm down. Just take a few deep breaths," and then doing this action while a second teammate says, "It's a good day to be happy! I didn't have any cavities!" and the final team member answers, "I can see from your face that you're happy about something! Share the good news with me!"

Audience members will have the experience of seeing the intelligence in action, and this method of defining can create the positive examples that glue the information to their brains. The presenting team then will give examples of finding this intelligence in the adult world: job-related tasks that use the intelligence or careers that attract people who are comfortable using the intelligence. Next, the team will direct the audience through the intelligence-targeting activity. Finally, each audience member will write a reflective journal entry that focuses on redefining the intelligence in personal terms, his or her own comfort or discomfort with the intelligence, and an example of how an adult in the audience member's personal life uses the intelligence positively. The presenting team will ask audience members to share their definitions and examples with the rest of the group. The teacher may conclude with suggestions about ways students could strengthen this intelligence outside of the classroom. The teacher also will suggest references that contain more information about the intelligence for interested students and audience members.

The Reflection

After each team completes its presentation, members will produce a visual in which they rate their performance in several categories. For each category, the team will draw an applause-o-meter and the rating that most members feel they earned. To practice kaizen, the team will look at each of the rated categories and identify one improvement they would make in each area if they were asked to do this task again.

Finally, each team will design and produce a graphic representing an award for their performance. This award will be for their experiential learning of the targeted intelligence and the skill of writing, producing, and presenting the infomercial to "sell" their intelligence to their classmates. The teacher will encourage teams to give themselves credit for a job well done and to give themselves awards that emulate the Oscars or Emmys in style and design. This final celebration of success will solidify the positive feelings that students have about their learning and make the learning deeper and more lasting.

Reflection

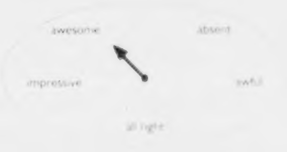
TEAM REFLECTION

Rating Our Performance

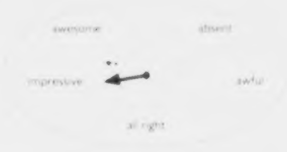
Create a visual in which you rate your performance in several categories. For each category, draw an applause-o-meter and the rating the group agrees on. Then, identify one improvement you would make in each category if you were to do the task again.

Sample Applause-o-Meters

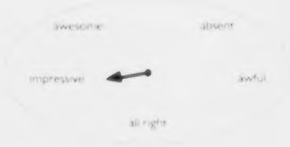
Category: Introducing and describing the intelligence
The rating we give ourselves is . . .
Our reason for this rating is . . .
One improvement is . . .


awesome
absent
impressive
awful
all right

Category: Use of writing skills
The rating we give ourselves is . . .
Our reason for this rating is . . .
One improvement is . . .


awesome
absent
impressive
awful
all right

Category: Giving examples of careers for the intelligence
The rating we give ourselves is . . .
Our reason for this rating is . . .
One improvement is . . .


awesome
absent
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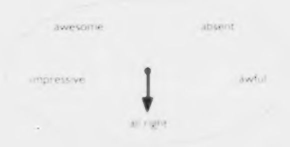
awful
all right

Category: Audience-involvement experience
The rating we give ourselves is . . .
Our reason for this rating is . . .
One improvement is . . .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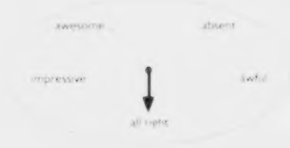
Category: Discussing the audience reflection
The rating we give ourselves is . . .
Our reason for this rating is . . .
One improvement is . . .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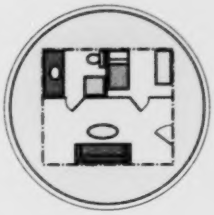
Chapter 8

Perfectly Proportioned



The Performance

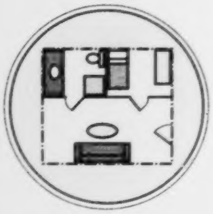
When students become independent adults, they will need to know how to calculate with ratios, proportions, and percents in order to plan their personal budgets, estimate their income tax responsibilities, determine the sales tax charged on purchases, figure gratuities for service personnel, read floor plans and blueprints, understand road maps, and scale recipes up or down. As he introduces this performance learning task, the teacher will explain that students will be designing the blueprints and occupancy rates for a health spa-resort: the Scale Drawn Mathematics Club.

Students will work in teams of four, and each team will plan a resort, do a scale drawing of the facility, and calculate sample room charges using percents to determine sales tax and occupancy tax. Each student team will make a large presentation graphic of its scale drawing and an advertising brochure for its resort and present the resort to the rest of the class at the end of the task.

This performance learning task will give students a practical application on which to practice ratio, proportion, and percent calculations. Instead of doing a worksheet exercise, students will discuss their resort plans with teammates, calculate the length of each line in the scale drawing, determine the daily price of each kind of suite using percent calculations, and be able to demonstrate proficiency in the mathematical skills using a new set of numbers provided by the teacher. This contextual learning will help students become more engaged in the learning task and achieve deeper, more permanent learning of these skills.

The Prompt

The teacher may decide to begin this performance learning task by asking students to brainstorm ways in which adults use ratios, proportions, and



percents in their lives. The teacher may suggest that while adults may not actually do each of these kinds of calculations every day, knowing the concepts that underlie the computations helps adults make sense of their lives. An adult looking at a map, for example, knows that the lines between towns are proportional to the actual distances. A line that is twice as long as another represents twice the distance. Adults also know that different maps use different scales. In a standard road atlas, the state maps of Vermont and South Dakota are each allotted one page. South Dakota is geographically much larger than Vermont, so the map drawings must use different scales. If an adult wants to know whether the money in her pocket will pay for an item in a store, she needs to mentally estimate the sales tax and add the amount to the one on the price tag to get the total price of the item. A buyer who does not take this precaution might wind up leaving an item at the cash register because the cash she has is less than the total price. The teacher will take some time with this part of the prompt, give many examples that fit the community where the students live, and then tell students that they will be doing a performance learning task to practice their use of these mathematical skills.

During the presentation performance for this task, each team will show and explain the scale drawing for its planned resort. Members of a team will answer questions that classmates pose about their plan, and they will try to sell their plan to the rest of the class. Teammates will go through examples of the calculations they used to determine how long to make the lines in the scale drawing. The team will explain examples showing how to use sales and occupancy tax calculations in determining the total price of a suite for one night. Each member of the team will take a turn describing one of the calculations to demonstrate his or her proficiency with the calculations.

The Vision

Professionally produced maps are excellent scale drawings, and the teacher may want to use maps to introduce or review the concept. Books or websites that focus on a particular architect may include scale drawings of his or her floor plans. The teacher and students also may find professional quality scale drawing examples at <http://www.co-opcity.com/p.16.htm> and <http://www.nsa.gov:8080/programs/mepp/es/geom01.html>. Both of these sites contain references to lesson plan materials the teacher can obtain to teach and reinforce scale drawing skills.

Many sales tax calculations are performed automatically by computer sales registers. The teacher will collect a large number of register tapes. He may save some of his own and ask friends to contribute their sales tapes. Students also may volunteer to bring in sales tapes. The teacher will make several transparencies for the overhead projector that show the final rows of information on several of these tapes (see fig. 8.1).

Sales Tapes

Subtotal	$52.78
Tax 6%	$3.17
Total	$55.95

Subtotal	$42.80
Tax 6.5%	$2.78
Total	$45.58

Figure 8.1

He will ask students, "Where does the figure in the second row of each example come from? What do the tax rate (the percent) and the subtotal have to do with figuring the tax amount?" The teacher and students will review how to calculate using percents and will check the figures from the register tape examples for accuracy.

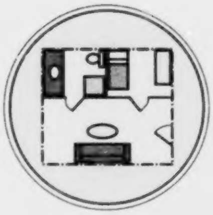
A more complex example is shown in figure 8.2.

Sales Tape

Subtotal	$79.95
Tax	$5.60
Total	$85.55

Figure 8.2

The teacher will show this example to the class and ask, "How can we check on the tax figure on this receipt? What information is missing? How could we find out that information?" Teacher and students will review how to calculate what the percent is using the information in the example. Then they will compare the answer that they get for the tax rate (percent) with the actual value for sales tax in the area to determine if the cash register information is correct. The teacher will ask each student to do calculations



using the numbers on at least six sales receipts to practice using percents in calculations. Students will find that the tapes are accurate; shoppers are being charged the correct amount of sales tax. The teacher will ask, "Is this important to a business? Do customers need to know that billing is correct? Why would that help a business?" Students will decide that correct billing establishes a trusting relationship between the business and the customers and encourages the customers to use the business again.

The Standards

Students will do this performance learning task to sharpen their ratio, proportion, and percent calculation skills. The teacher will check their proficiency and accuracy in doing these calculations by asking them to work with his numbers to do new calculations. Students will know that they need to do the calculations with complete accuracy to have a trustworthy business.

Students will also learn some facts about the fitness activities and facilities they plan for their resort. They may gain some insight into the kinds of problems faced by professional architects in planning large facilities, and they will enhance their graphic art skills as they plan their sales brochure. The steps in this performance learning experience and the standards are included in the task development chart (see fig. 8.3).

Students will use the performance rubric (see fig. 8.4) for the task to evaluate the quality of their resort plan scale drawing and their personal math skills. This self-evaluation can point students toward the improvements they can make in their performance to prepare for the final presentation.

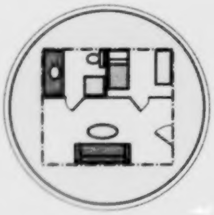
The Coaching Context

Setting the Stage

As the teacher introduces this performance learning task, he will suggest that before they plan the resort, students need to think about the services and features that would entice them to stay at this type of facility. The teacher and students will brainstorm answers to questions that reflect a customer's point of view and concerns.

- If we were planning to spend a week at a fitness spa-resort, what facilities would we look for?
- When we checked in, what luggage and counter assistance would we want?
- What about getting our belongings to our rooms?
- What housekeeping services would we want?
- What food services would we want?

- What kinds of physical activities would we enjoy doing at the spa-resort?
- What facilities and equipment are needed for those activities?
- How would we get from our rooms to the other facilities at the resort?
- How could we minimize the discomforts that might be a result of bad weather?
- What extra services might we want?



The teacher may need to help by describing the resort experience before the class starts the brainstorm, as some students may not be familiar with the features of a quality resort. He can walk students through the process by providing an ongoing narrative that begins, "You have decided to get away from the everyday world and spend a week at the Scale Drawn Mathematics Club, a high class, high quality fitness spa-resort. You and your luggage, including your gym bag with your workout clothes, arrive at the front door of the club. A doorman greets you, puts your bags on his cart, and guides you to a long, gleaming marble counter behind which you see several neatly uniformed, smiling people. One of them steps forward and says, 'Are you going to be a guest here? What is your name? Ah, yes, Ms. Proportionale, here is your reservation. You are in suite 1000,' and the check-in continues."

After he describes a part of the resort experience, the teacher will ask the class to summarize the events or activities the guest experienced and the resort facilities and personnel the guest encountered along the way. The teacher will emphasize the idea that in order to plan a resort that will attract business, students need to predict what services and features will attract new customers and encourage old ones to return.

The Physical Plant

The teacher and students will inspect the ideas they generated during the brainstorm and agree on a list of resort facilities. The physical plant may include a reception lobby, a number of one-bedroom suites, some larger suites, shops, an informal buffet style restaurant, and a more formal dining room. The recreation and fitness areas could include racquetball, tennis, or handball courts, basketball and volleyball gyms, a weight training area, a jogging or walking track, a swimming pool, and a whirlpool.

The teacher will assign the students to groups of four and tell students to distribute these roles: the architect, who keeps the team focused and on task and who does the scale drawing of the guest suites; the activity director, who paraphrases, clarifies, and does the scale drawing of the ball court facilities; the fitness coach, who encourages everyone to participate and does the scale drawing of the rest of the fitness facilities; and the concierge,

Task Development Chart: Perfectly Proportioned

Performance Tasks	Developmental Levels	Curriculum Standards
Create the spa-resort floor plan using information about • Regulation playing court sizes for all activities. • Standard hotel/resort room sizes for all room types and common areas.	***Novice*** Performs basic operations using whole numbers. Locates towns on a map, but doesn't know what a scale drawing is. Acts unaware of sales or other taxes.	***Mathematics*** Do calculations with proportions and percents. Show that results are correct or estimated answers are reasonable. Use ratios and proportions to calculate lengths of lines for a scale drawing.
Calculate ratios and proportions for all scale drawing measurements. Partners: Check each other's calculations. Individuals: Do assigned portions of scale drawing.	***Advanced Beginner*** Performs basic operations with whole numbers. Expresses ratios as fractions of whole numbers. Knows that a map is a scale drawing, but isn't sure what that means. Aware of the terms *sales tax*, *income tax*, etc.	***Applied Technology*** Design floor plans for the resort. Use a variety of layouts for public areas, suites, dining facilities, and exercise areas. Produce scale drawing blueprints for the architectural plans.
Assemble the entire scale drawing. Check assembly to be sure that all pieces fit together properly. Label spaces as needed. Prepare the scale drawing for the presentation performance.	***Competent User*** Performs basic operations with decimals. Expresses ratios as decimal values. Explains what a scale drawing is, but is not sure how to produce one. Knows the local sales tax percent.	***Physical Development and Health*** Identify exercise or fitness activities likely to be part of resort or spa life. Know the regulation sizes of planned fitness facilities: game courts or fields, lap swimming pools, weightlifting rooms, aerobic exercise rooms.
Decide on room rates for American and European plans. Calculate the tax; check partner's calculations. Calculate total prices. Create the brochure.	***Proficient Performer*** Performs calculations with decimals with ease. Verbalizes ratios in multiple ways; e.g., "One quarter of a dollar is 25 cents is 25 percent is 0.25." Uses ratios and proportion to produce scale drawing. Calculates sales tax with pencil or calculator.	***Visual Arts*** Use elements of design in planning advertising brochure. Design graphics, logos, or other illustrations for brochure.
Put on the performance presentation. Each Team Member: Demonstrate and explain one type of calculation: scale drawing, sales tax, occupancy tax, total room cost. Hand out brochures. "Walk" the audience through the resort.	***Expert*** Uses decimals and ratios to make comparisons without prompting. Scales measurements up or down in making drawings, using recipes, following patterns. Estimates sales tax "in his or her head" to figure total prices of purchased goods.	***Language Arts*** Use precise vocabulary to describe the resort in the brochure. Check brochure for subject/verb agreement, punctuation, and other writing conventions.

Figure 8.3

Performance Rubric: Perfectly Proportioned

Developmental Level Performance	Toes 'n Fingers	Paper 'n Pencil	Charts 'n Tables	Calculator	Computer
Plan Spa-Resort Facilities	Models after "Motels-R-Us"—small bedrooms and baths, no living rooms in suites. Designs cramped restaurant areas. Includes one activity area: basketball.	Designs bigger suite rooms; still no living room! Includes more restaurant tables, very close together. Includes large reception area/lobby. Adds basketball, weight room, and whirlpool.	Designs bedroom, bath, living room in all suites. Designs wide aisles between restaurant tables. Includes large lobby/reception areas. Adds basketball, weights, aerobics, and whirlpool.	Designs complete suites with large rooms. Designs wide aisles between restaurant tables. Designs spacious public areas. Includes all mentioned activities plus swimming.	Designs large, complete suites with whirlpool tubs and kitchens. Designs private alcove for each table in restaurants. Designs great public areas. Includes all mentioned activities plus handball.
Generate Scale Drawings	Prepares rough sketch only. Sketches with nothing to scale. What goes where?	Uses different scales for different areas. Does not fit parts to whole. Are the calculations correct? Who checked?	Uses a common scale for separate parts. Fits most pieces together; calculates correctly for most. Gives confusing corrections: Which lines are the right ones?	Uses consistent scale throughout. Fits sections together precisely. Produces with reproducible quality. Calculates superbly!	Uses uniform scale, line width, and darkness. Fits sections together seamlessly. Produces blueprint quality. Calculates correctly always.
Calculate Prices	Uses one night/one price. Omits tax calculations. Is tax included?	Uses a hotel-type price structure. Adds tax to base price: What's the percent? How can this be checked for accuracy?	Provides detailed price structure. Gives sales and occupancy tax rates. Gives total prices. Includes some inaccurate prices.	Gives detailed price structure. Provides complete tax rate information. Provides accurate prices.	Gives detailed prices and tax information. Gives sample of total price calculation, including sales and occupancy tax rates. Provides accurate prices.
Produce Resort Brochure	Gives resort name and one night/one price information. Omits fitness areas or other facilities. Omits graphics.	Includes name and price structure. Names fitness activities. Omits restaurant information. Omits graphics.	Includes name, price structure and sample suite layouts. Describes fitness areas. Omits restaurant information.	Includes name, price structures, tax rates, and suite layouts. Details fitness areas. Names restaurants.	Gives complete information including reservation system. Includes maps of fitness floors. Provides restaurant hours.
Participate in Presentation	Presents as a total lecture: "This is the resort. Come see it."	Lectures with detail: "This is the resort. These are the activities. Come see and do."	Lectures with feeling: "This is the resort. These are the activities and how you will enjoy them. This is the food. Come see, do, and eat."	Lectures with invitation: "This is the resort. We like our guests and want you to be one. Come see, do, eat, and be welcome."	Lectures with experience: "This is the resort. Walk in. Be greeted. Open your door. Turn on your whirlpool. Relax! Enjoy! How can we serve you?"

Figure 8.4

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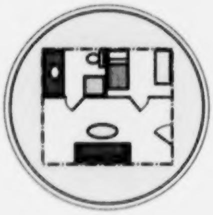


who keeps the team energized and does the scale drawing of the lobby, food service areas, and grounds. The team will need to decide if their Scale Down Mathematics Club is in the city or a rural area, what fitness facilities, if any, are outdoor ones, and whether they want a high-rise, vertical facility or one that is more horizontal. Students and teacher will review the principles of doing scale drawings and decide on a scale for this project drawing.

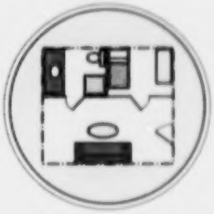
Information and Specs

As they plan the actual facilities, students will want to collect information about regulation sizes of the exercise areas. A physical education teacher can help them find rule books and other sources of information about the specifications of the sports courts and fitness rooms. Students also will need information about the sizes and layouts of hotel and resort guest suites. They might contact the managers of local facilities, explain the performance learning task, and ask for floor plans. They might check the school library for information about hotel and resort management and planning. They also might check on the Internet for websites of chain hotels that run resorts—these sites may include e-mail links to a customer service department that could provide students with helpful information.

The Scale Drawing

Each member of a team will sketch a rough layout of his or her assigned areas indicating the relative locations of facilities and their dimensions. He or she will then do the scale drawing calculations for the assigned areas, using ratio and proportion to determine how long to draw the individual lines. If parts of the drawing seem incorrect—for example, if lines meet too soon or do not meet when they should—the student will recheck the calculations for accuracy. Because each team member is doing only part of the scale drawing, each individual will want to be certain that the assigned part will fit into the larger whole. Students will check their scale drawings for accuracy of scale and orientation with respect to the other parts of the resort. The team goal is to have all parts of the scale drawing fit together perfectly.

The team will meet to assemble the individual drawings into a master scale drawing of the resort facility. The activity director and the architect will check each other's calculations and drawings for accuracy; the concierge and the fitness coach will do the same for each other. As soon as all parts have been checked for accuracy, the team will paste the scale drawing together to see if all of the parts fit. Different parts of a single floor of the facility should match up. If they do not, the team will want to recheck the calculations and the orientation of the drawings. Members will go back to the original agreements about the facilities layout to be sure that everyone had the same visual idea before starting the individual drawings. This will be the time to resolve any misunderstandings and to ensure alignment of the separate pieces of the final scale drawing.



Next, each teammate will produce a presentation-quality scale drawing of his or her portion of the facilities. All lines will be drawn precisely and sharply in black. These final drawings will be perfect. There will be no smudges, erasures, or white-out. The team will assemble the completed pieces on a large sheet of poster board, being very careful with glue or tape. The teacher will store the presentation copies of all scale drawings in the classroom until teams present their resorts to the class.

Room Rates

Teams will need to decide what price to charge for a one-night stay in each of their guest suites. Before students set the room rates or do any tax calculations, the teacher will give them some information about the rate structures in most hotels and resorts. Smaller suites generally are less expensive than larger ones. The lowest room rate usually is based on occupancy by one or two people. Some resorts have a per person rate that includes some meals—either a continental breakfast or breakfast and dinner—each day. Using this information, a student team might develop a rate structure for one- and two-bedroom suites as shown in figure 8.5.

Once teams have decided their price structures, they will calculate the sales tax and occupancy tax for each of the suite prices so they can determine the total cost of each of the suite types for one night. The teacher will

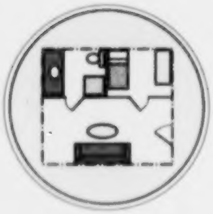
One-Bedroom Suite Rates

American Plan		**European Plan**	
includes continental breakfast only		*includes full breakfast and dinner*	
Occupancy by		Occupancy per person	
1 or 2 guests	$125/night	Each guest	$115/night
3 or 4 guests	$135/night		

Two-Bedroom Suite Rates

American Plan		**European Plan**	
includes continental breakfast only		*includes full breakfast and dinner*	
Occupancy by		Occupancy per person	
1 or 2 guests	$195/night	Each guest	$165/night
3 or 4 guests	$205/night		

Figure 8.5



suggest that students can get information about sales and occupancy taxes from local hotel managers or from the Internet. Some websites that contain useful information at the time of this writing are

- http://www.littlejason.com/lemonade/index.html (business simulation)
- http://www.salestaxinstitute.com/rates.html (sales and use tax rates)
- http://www.gurnee.il.us/municipal_code/38.01.html (example of a municipal occupancy tax code)

Each student in a team will do the calculations, and teammates will compare answers to check each other's accuracy. Each team will include the total price information in its resort brochure.

The Advertising Brochure

As each team prepares for the presentation performance, members will design a brochure to advertise the spa-resort and its facilities. Teams may want to adopt names and logos for their fitness corporations. The teacher will ask the local chamber of commerce for copies of commercially produced brochures so that students can examine several different layouts and see what kinds of information an actual hotel or resort chooses to highlight.

The teacher will give students a list of the required brochure items:

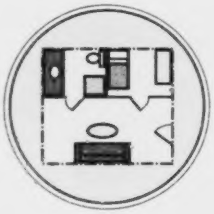
- Available recreation and fitness facilities
- Food service facilities
- Nearby public areas of interest and their hours
- Types of suites and their cost
- Additional amenities (such as meals)

Student teams will decide how to lay out and illustrate their brochures. Each team will produce a copy-ready brochure, and the teacher will arrange to duplicate a copy of each brochure for each class member. Teams will get their brochure copies before the presentation date, fold the brochures, and practice their presentation performances.

The Presentation

To present its resort to the rest of the class, each team will plan a combination math lesson, lecture, and role play. The team's goal will be to help the audience vicariously feel the spa-resort experience and to present examples of the calculations used in the scale drawing and pricing information. A team might begin its presentation by saying, "Good afternoon, vacation seekers, and welcome to the Scale Drawn Mathematics Club. As you arrive at our door, you are greeted by Walter, our doorman, who will transport your luggage into the reception area and introduce you to a reception clerk."

One teammate will then role-play Walter's actions and words while a second takes the part of the check-in clerk. The team will walk the potential customers through check-in, arriving in their suites, settling in, choosing and using an exercise facility, and having a meal.



As the teammates describe the suite, one person will use the scale drawing to point out the suite and describe its layout, a second will explain a sample calculation used to do the scale drawing of the suite, a third will explain the suite's rate structure, and a fourth will do a sample calculation of the total suite cost for one night, including complete tax calculations.

The team will ask for questions from the audience and will clarify any confusing or incompletely understood points in the presentation. At the end of the presentation, each audience member will receive a copy of the resort brochure, and the team will conclude by encouraging audience members to patronize its version of the Scale Drawn Mathematics Club.

The Reflection

After the presentation performances, each team will reflect on the Scale Drawn Mathematics Club experience by doing a PIE chart (a transmutation of de Bono's PMI chart).

Each individual will demonstrate personal mastery of the math skills in two ways: by producing a scale-drawn map showing his or her route to school and by completing new calculations involving taxes and percents as assigned by the teacher. The teacher will take care to ensure that the new calculations ask students to use the same kinds of calculating skills they practiced in the performance learning task. Each student will do the calculations and map in his or her course journal and make a personal copy of the team PIE chart. Finally, the students will highlight one "E" from the PIE chart in a top-five list.

Reflection

TEAM REFLECTION

P **P**luses About This Learning Task	**I** **I**nteresting Learnings from the Task	**E** Daily **E**ncounters with Sales and Other Taxes and Scale Drawings

INDIVIDUAL REFLECTION

My most often encountered "E"

The five most memorable times that I have encountered this E are
(5 = least, 1 = most)

5.

4.

3.

2.

1.

PART III:

ADVANCED PERFORMANCES

AttaGram
For: ______
Way to GO!!!

Chapter 9

Patterning Neurons to Picture Patterns

The Performance

Students live in a world filled with natural and artificial objects whose outlines contain a variety of geometric shapes. A well-trained eye can find rectangles, squares, rhomboids, parallelograms, triangles, circles, ovals, parabolas, hyperbolas, and more hiding throughout the everyday world. To students who do this performance learning task, these geometric names will represent more than lines drawn on a sheet of paper. These students will understand that the names represent abstractions of forms that fill the world around them. They will discover and document a crucial connection between a content discipline and the world in which they live.

Students who are learning to identify basic geometric shapes will work in groups of four to find examples of these shapes in their worlds and to make a photographic record of their finds. The teacher will guide students through an introduction to photographic techniques. To demystify the production of a photographic image, the teacher will explain the basic principles governing the chemical processes that occur on the strip of film.

Each student will find objects that he or she believes provide clear examples of the geometric shapes. Teammates will view each other's examples of community geometry, agree on which everyday examples show the shapes most clearly, and photograph those examples. To produce a display of its examples, each team will assemble a collage containing photos illustrating each shape. Students must have an individual photo for each shape although a photo may depict more than one shape. The teacher will arrange a gallery of these collage posters in the classroom, and all teams will take a gallery walk and study each other's collages, looking for the geometric shape or shapes in the outline of the object that is the focal point, or center of interest, of each photo.

Each team also will select a popular song or nursery rhyme and rewrite the lyrics to include the names of the geometric shapes. Students will perform the song, singing the lyrics and acting out the shapes each time they

are mentioned. As students do this performance learning task, their actions will promote the formation of memory patterns for these shapes that result in deeper, more permanent, and insightful learning. This kinesthetic learning activity promotes the formation of procedural memory patterns that, once formed, are hard to forget (Sylwester 1995).

The Prompt

To engage students' interest in this performance learning task, the teacher will say, "Raise your hand if you know someone who takes photos for fun." In many classrooms, almost every student will raise a hand. The teacher will then ask students for examples of times when these persons pull out their cameras.

Students and teacher will brainstorm a list of everyday photo opportunities: parties, birthdays, holidays, family gatherings, and other memorable moments. Next, the teacher will ask, "What might some of these daily life photos have in common?" and record some of the answers on the chalkboard or on chart paper. These answers might include people, pets, party decorations, game playing, or outdoor scenes.

Finally, the teacher will give each student a sheet showing the outlines of a variety of geometric shapes and their names. She will say to the students, "How often do you think that a photo might contain one or more of these shapes? These shapes are abstractions of outlines that people have found in everyday objects. You can find them in the outlines of natural and artificial objects in your own world."

The teacher then will describe the performance learning task. Each student will find examples of objects whose outlines include at least one of the geometric shapes. Working in teams of four, students will view each other's examples, and teammates will agree on the best example to represent each shape. The teammates who found the selected examples will photograph them from a variety of angles.

Each team will look over its developed prints, choose one photo for each shape that best represents it, and mount the selected photos as a collage poster. The poster will demonstrate the team's expertise in using the design elements of spacing, framing, patterning, and repetition. Other teams will analyze the collage posters, identify the basic geometric shapes best illustrated by each photo in the collage, and provide written feedback to the collages' creators. As they do the performance learning task, students will be learning some basic photography skills and embedding the basic geometric shapes of everyday life in their long-term memories.

The Vision

Collections of works by two highly creative, contemporary photographers clearly demonstrate the relationship between everyday objects and geometry. As students view *Triangle, Square, Circle* by William Wegman (1995) or *Shapes* by Anne Geddes (1998), they will see examples of these geometric connections. The teacher will help students analyze these photos for elements of light, line, color, framing, repetition, and pattern that contribute to their overall visual appeal. Because both of these books target young children, they contain examples that are clear illustrations of the learning targeted by this performance task. Both of these photographers also demonstrate the use of natural objects in creative, whimsical ways that students may find fun and appealing. The teacher will encourage students to use these examples as models when they set up, frame, and take their own photographs.

The Standards

When teams finish this task, each member will have learned some basic photographic skills and the connections between geometry and the physical world. Each student will be able to see basic geometric shapes in everyday objects. Students may find themselves looking at an object and thinking, "Isn't that interesting? If I look at that birdfeeder from below, the roof looks like a parallelogram. Viewed from above, the roof looks rectangular." Each student will find that he or she is aware of the lighting, framing, and line of everyday scenes. Students may find themselves humming their geometry songs while they shower. The steps in the performance learning task and the curriculum standards are outlined in the task development chart (see fig. 9.1).

Students may use the performance rubric (see fig. 9.2) for this task in a variety of ways. They may compare their photos with the standards outlined in the rubric to select the examples for the collage poster. Students may self-evaluate their own skills at remembering the geometric shapes and finding real-world examples that show those shapes. A team may use the rubric to evaluate and improve its geometry song. Every student will have a copy of the rubric to use throughout the performance learning task.

The Coaching Context

The Geometry Shapes

Students need to know what shapes to identify and look for before they begin their search for objects to photograph. The teacher will give each student a one-page guide that shows and names the basic geometric shapes (see fig. 9.3). She will suggest that students write the names and locations of the objects they want to photograph on this guide. Students can use the guide to help them keep track of the examples they identified and where these examples are located. This will facilitate the team members' work as they view the examples together, decide on the best example for each shape, and take the photos.

Task Development Chart: Patterning Neurons to Picture Patterns

Performance Tasks	Developmental Levels	Curriculum Standards
Learn how to use a simple camera. Consider visual elements of the picture before taking it. Examine and analyze outstanding photos in class to learn these elements. Learn basic science that explains how and why film produces images.	***Novice*** Describes shapes as straight or curvy. Holds camera upside down, cuts off tops or bottoms of objects. Uses poor lighting and no framing; shows no awareness of effective composition.	***Visual Arts*** Understand the process of photography. Take photos that demonstrate an understanding of line, space, framing, repetition, pattern, and lighting. Select photographic subjects whose outlines include elements of basic geometric shapes. Arrange photos effectively in a collage.
Whole Class: Look at examples of basic geometric shapes. Review the basic geometric shapes guide. Look for examples of objects whose forms contain one of the basic geometric shapes. Look at home, in the neighborhood, anywhere but at school.	***Advanced Beginner*** Confuses squares and rectangles, circles and ovals, rhomboids and parallelograms. Gets entire subject in photo with adequate lighting. Uses poor framing and composition.	***Mathematics*** Identify geometric shapes contained in the outlines of everyday natural and artificial objects. Find those shapes without prompting and name them correctly.
Teams: Agree on objects to use as examples for the geometric shapes. Photograph the objects. Select the best photographs. Assemble the geometric shapes collage poster.	***Competent User*** Identifies basic geometric shapes. Sees them in everyday objects with some prompting. Centers complete subject in photo, uses light well. Uses no other features to add pattern or perspective.	***Science*** Describe how photographic film produces an image. Learn how the amount of light energy reaching a spot on the film affects the chemical changes that result in a photographic image.
Write and rehearse the geometric shapes song. Produce copies of lyrics for classmates.	***Proficient Performer*** Sees basic geometric shapes in artificial objects. Uses light and shadow, showing interesting contrast, in photo. Frames subject well; uses features to add perspective and focus interest on subject.	***Music*** Demonstrate good use of rhythm by writing lyrics to a recognizable tune and naming the geometric shapes. Rehearse and deliver the song with confidence.
Do the gallery walk. Identify the shapes in other teams' photos. Identify and locate the shapes in each photo. Look at other teams' analyses of photos. Did they see what your team saw? If not, can you see what they describe?	***Expert*** Sees basic geometric shapes in a wide variety of artificial and natural objects. Uses lighting and color effectively in photos. Highlights subject by framing. Uses patterns to lead the eye in many directions. This person "plays with pictures."	***Applications of Learning*** Connect visual analysis of objects with math. Connect math and science with the hobby of photography. Explain the connections to family members.

Figure 9.1

Performance Rubric: Patterning Neurons to Picture Patterns

Developmental Level Performance	Blob	Points	Lines	Triangle	Pyramid
Compose Illustrative Photos	Provides no clear center of interest. Uses too much or too little light. "Points and shoots" without looking at photo composition.	Focuses center of interest so it's easy to spot. Provides no evidence of framing. Uses too little/too much light or poorly positioned light.	Provides center of interest that stands out. Uses no framing or patterning. Highlights center of interest by lighting.	Frames center of interest clearly and uses other strong images or lines. Shows well thought-out overall composition. Uses good lighting.	Frames center of interest clearly and strongly. Adds people and/or objects to strengthen composition. Uses light and shadow contrasts well.
Find Geometry in Everyday Objects	Does not connect abstract geometric outline with any everyday object.	Finds shapes only in artificial objects. Finds straight line shapes but not curves. Uses correct geometry names at least 50% of time.	Easily sees shapes in artificial objects. Finds all shapes with equal ease. Names geometric shapes correctly at least 80% of time.	Sees shapes in artificial objects as a matter of habit. Uses shapes' names in discussing objects' outlines. Uses correct names all of the time.	Finds all geometric shapes in artificial and natural objects. Uses shape names in discussing outlines. Thinks in shapes in sketching objects and doing visual layouts.
Design Geometric Shapes Poster	Spaces photos poorly. Lays out photos without a plan. Has smudges, is messy. Omits title.	Spaces adequately. Uses grid layout. Includes blobs of paste, lots of white-out. Uses small, hard-to-read title.	Spaces adequately. Groups photos in "shape alike" clusters. Mounts and labels photos neatly. Letters title neatly.	Spaces well. Clusters photos and adds border using colored marker; nice touch. Mounts and labels photos neatly. Uses large, bold title.	Lays out photos creatively, with good spacing. Adds colorful border to each photo. Angles photos to create an overall repeating pattern. Mounts and labels cleanly. Uses eye-catching title.
Compose and Perform Song	Uses lyrics that do not match meter. Uses inaudible voice. Mumbles and mutters.	Forces lyrics to fit meter. Uses audible volume. Garbles lyrics (need printed sheet to decipher them).	Fits lyrics to meter 80% of time. Uses good volume. Enunciates well. We could hear and follow this team.	Matches lyrics to meter well. Uses good volume. Enunciates clearly. Uses clear melody. We could easily follow this team.	Matches lyrics to meter and rhyme scheme well. Uses good volume, melody, and enunciation. This team is having fun! They invited us to join in!
Produce Scrapbook and Metaphor	Uses a few photos with no shapes outlined. Does not complete metaphor.	Includes photos for 50% of shapes. Provides no examples of several shapes in one photo. Gives a metaphor with one "because."	Uses one photo for each basic shape. Provides no examples of a photo containing two or more shapes. Gives two "because" metaphors.	Includes at least one photo per shape, two for many. Provides one example of several shapes in one picture. Gives three "because" metaphors.	Provides at least two photos for each simple shape. Provides two or more examples of several shapes in one picture. Gives three or more "because" metaphors.

Figure 9.2

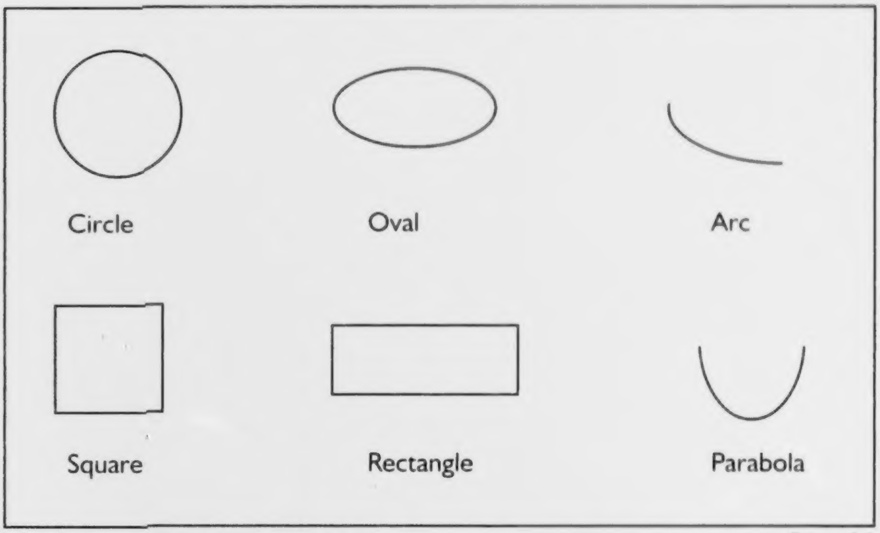


Figure 9.3

Photo Basics

Some students in the class may be very skilled at taking photos. Others may have never handled a camera. The teacher will poll the class to identify the experts and the beginners before making team assignments so that she can distribute the experts among the teams in the class. The teacher also will help students find sources of information about photography. The school or classroom library may have helpful books or pamphlets. The Internet is another good source of information. Some websites that students might want to check out are

- http://www.suite101.com/article.cfm/photography/10602 (description of photography essentials)
- http://www.88.com/exposure/index.htm (crash course in beginning photography)
- http://www.kodak.com/US/en/nav/takingPics.shtml (guide to taking better pictures)

Some students may be able to make their own cameras available for their teams, and teammates may agree to share the cost of the film. The teacher may provide each team with a disposable camera, purchased with budgeted funds or with funds provided by students or a parent-teacher organization. The teacher and class will decide how to pay for the film processing and printing. One-use, disposable cameras need to be sent to a special processing center, and the students and teacher may want to ask a booster group or parent-teacher organization for help with the costs or the teacher may request funds for photo developing from the school.

The teacher will want students to know some of the scientific principles that explain the production of photographic images. She will tell students that the film is actually several layers of material, some of which contain light-sensitive substances, and that when light falls on these substances it produces chemical changes that alter the substances' appearances. More exposure to light means more of the substances will change chemically. Differences in darkness or lightness in a finished photograph result from different amounts of light reaching those parts of the film. The teacher may give students negatives to examine so that they can see the difference between the negative and the finished print.

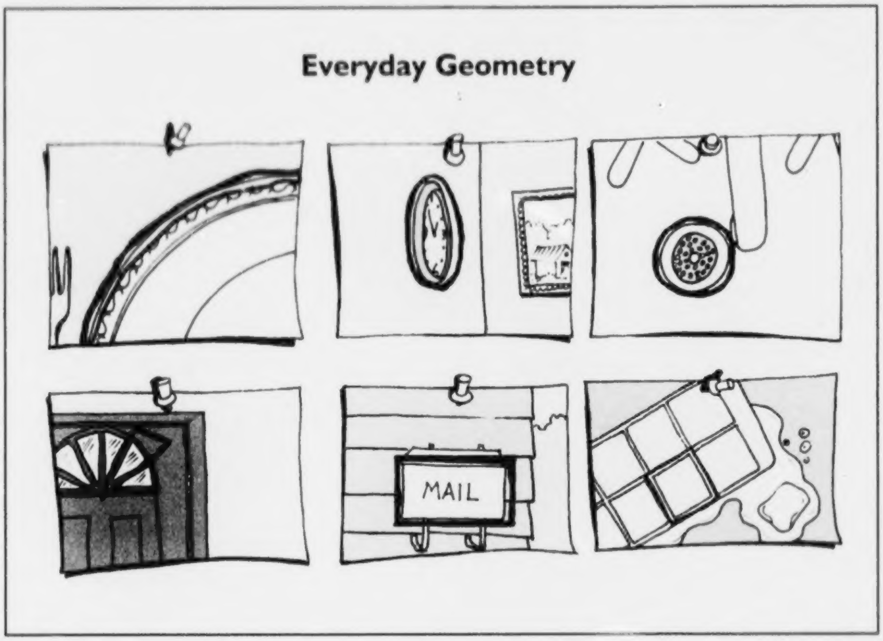
Students do not need to know a significant number of details about this scientific concept. The teacher will want them to know enough so that they realize that definite, explainable physical and chemical processes produce the final photographic print. Students and teacher will examine many examples of professionally taken photos. As they do, the teacher will point out the use of lighting and line to obtain an overall visual effect, the use of framing to focus the viewer's attention on the center of interest in the photo, the use of patterns or repetitions to suggest an ongoing process or establish a mood, and the use of a variety of camera angles to produce unique views of a subject.

The teacher might suggest that each student jot some notes about photographic techniques that he or she especially wants to remember. Books of work by noted photographers such as Anne Geddes and William Wegman can be made available in the classroom on an ongoing basis. The teacher will encourage students to browse through these books often to refresh their memories about what they like in the techniques of these photo professionals.

The Search for Examples

Students will use their geometric shape guides to search for artificial and natural objects whose outlines contain those shapes. Each student will begin with an individual search and keep notes of what he or she found, where the object is located, and the shape that he or she sees in the object's outline. After the teams are formed, teammates will review their notes, describe the objects to each other, and explain where they can be found. Teammates will make arrangements to view each other's examples so that the team can agree on which object to photograph to show each geometric shape. Each teammate will photograph at least two of the examples, and each object will be photographed at least twice. One-use, disposable cameras are available with film that has twenty-four or thirty-six exposures, so students can take all of their photos using one of these cameras.

The teacher and students will agree on a date by which all teams are to have taken all of their photos. Students will then give their film to the teacher, who will arrange for the processing and return the finished prints to the students. Teams will examine their photos, select the best one for each ob-



Everyday Geometry

Figure 9.4

ject, and arrange these photos in a collage poster. Doing the collage poster will give teams another opportunity to demonstrate their understanding of the visual elements of space, framing, and patterning. Each photo will need to be bordered with a generous amount of unfilled space because each of the other teams in the class will be placing a sticky-note comment close to each photo. Teams will title their posters, use markers to create picture-frame borders for each photo, and sign the completed work. One format for a completed collage poster could look like the one shown in figure 9.4.

The Song

Each team also will write a song with lyrics that include the names of all the targeted geometric shapes. Teams will choose recognizable tunes, and they will practice singing their songs to be sure that the lyrics fit the rhythm. On the day of the final presentation, each team will teach its song to the rest of the class. This song is one device that will help students remember the names of the targeted geometric shapes. Following are sample lyrics, sung to the tune of "My Darling Clementine."

Geometric Shapes

Saw a circle and an oval
a hyperbola and square,
parabola and a rhombus
parallelograms to spare.
A rectangle on a corner
and an arc below a star.
Found them all and took their photos
and we noted where they are.

The teacher and class may decide that they want to publish all of the lyrics in a class "song sheet." Each student will receive a copy of these lyrics on the day of the presentation performance, and each team will take a turn demonstrating its song for the rest of the class and leading the class in song. After students hear and sing several of these songs, they will remember these geometric shapes.

The Presentation

To prepare for the presentation performance, the teacher will display the photo collage posters in the classroom, leaving a distance of several feet between posters so that each one is highlighted like a painting in a gallery. Each team will receive a small pad of sticky notes, and the teacher will say, "When I have finished with these instructions, each team will move to its own poster and wait for my signal. When I say 'switch,' each team will move to the next poster on its right. The teams will discuss the photos on the poster and identify the object that is the center of interest of each photo, name the geometric figure that is contained in the outline of that center of interest, and do a small sketch of the object, highlighting the portion where they see the geometric shape in the object's outline.

"The teams will write this information on the back of a sticky note, using a separate sticky note for each photo. The teams will place the sticky notes on the photos, near the bottom so that another team can still see most of the photo, making certain that the next team cannot see what is written on the sticky note. Each team will then write one last note, commenting on a photographic element that they think is very well demonstrated by the poster, stick it on the poster, and wait for another signal.

"When I say 'switch,' each team will move on to the next poster and repeat the process. When you get back to your own poster, please turn and face me. When I see all teams facing me, I will know that we are ready for more instructions." The teacher will ask for questions, make sure that students understand the task, and direct the activity.

When teams have completed the gallery walk and are standing in front of their own posters, the teacher will say, "Now, each team, take the sticky notes off your poster. Be sure that you know which photo goes with which group of sticky notes. Read the information on the sticky notes to see if your photo clearly showed what you intended. If another team saw something different in your photo, look closely at its sketch and the photo to see if you agree with its finding, and decide what learning you want to remember from this difference in perception. Keep track of what you and others see in each of the photos, and be ready to share that information with the rest of the class."

The Reflection

Following the gallery walk and feedback review, teams will reflect on and report what they have learned about different perceptions of pictured objects. The teacher will give each team two fine-point permanent markers, one black and one blue, and will tell teams to use the black marker to outline the geometric figure(s) they saw in each photo and the blue marker to outline any other shapes other teams picked out. She will provide time for teams to discuss the feedback and to outline the shapes. Then, each team will briefly explain to the class what teammates saw in their own photos, what other teams saw, and what they learned about the ways in which people perceive the same visual image. Teams will teach their songs to the rest of the class at the end of their poster reflection reports.

To transfer this new understanding about the roots of geometry to different settings, each student will search through magazines or newspapers, find new examples of the shapes in published photos, clip the photos and outline the shapes, and place the clippings in a scrapbook. The teacher will encourage the students to look for examples of objects that combine two or more of the shapes in their outlines and include these more complicated visual compositions in their scrapbooks.

Each student will also critique their own personal photography or visual arts skills by completing an analysis of their use of the visual elements in photography. To stretch metaphoric thinking, each student will complete a sentence starter that encourages them to see geometric shapes in nature.

Reflection

INDEPENDENT REFLECTION

How I See My Photography

Use this tool to record your self-evaluation of your picture-taking skills.

Visual Element	**What's Good? How Could It Be Better?**
Line and Perspective	
Framing and Space	
Lighting	
Patterning/Repetition	

When I Look at a Tree . . .

Complete the following by making at least three connections between natural objects and mathematical abstractions of their forms.

It used to be that when I looked at a tree, I saw a tree. Now I look at a tree and think, Wow! Geometry! because . . .

because . . .

because . . .

Chapter 10

Half-Life in World Life

The Performance

Applications of nuclear science have become embedded in everyday life in many world societies. Anthropologists and archaeologists use radioactive clocks to date the remains of plants and animals and to determine the age of human artifacts. Medical professionals use radioisotopes to diagnose and treat illnesses. Nuclear medicine uses imaging techniques that show both anatomical structure and biological functioning. Irradiation from gamma ray sources is used to preserve foods by destroying bacteria, yeasts, and molds that can cause food to spoil, and irradiation is also used to sterilize packaged medical disposables such as surgical booties, gowns, masks, and gloves. Home smoke detectors contain tiny amounts of radioactive material. Students are living in a world in which uses of nuclear science are rapidly increasing. If they are to make informed, intelligent decisions about the role of nuclear science in society, they need to understand some basic concepts and realities.

A key foundational concept of nuclear science is that of half-life. Half-life is the characteristic that determines the usefulness of a radioisotope as a radioactive clock. Some applications of nuclear science require that radioisotopes have a long half-life. Other applications require radioisotopes with short half-lives.

As students do this performance learning task, they will act out the concept of half-life, picture it graphically, read selections dealing with nuclear science uses and analyze the readings for value-laden statements, and examine public opinion toward current nuclear science applications. For the presentation performance, small teams of students will present information about a radioisotope used in nuclear medicine to the rest of the class, and the entire class will teach another group of students about half-life by leading an experiential lesson.

The Prompt

Students may not be aware of how important the applications of nuclear science have become in medicine. The teacher will introduce this task to his students by showing them color images of brain activity associated with specific behaviors such as speaking and listening. The teacher and students can find these images on the Internet. One website with clear, distinctive images is <http://suhep.phy.syr.edu/courses/modules/MM/Biology/bio_org.html>. The teacher will emphasize the fact that these pictures show the functioning of an actual person's brain as the person is engaged in a specific behavior, and he will ask his students, "How do you think researchers make these pictures? What techniques do they use to see brain cells at work?"

The teacher and students will review information about how cells burn glucose to get the energy they need to do work. As part of this review, the teacher will suggest that an increase in the work of cells is accompanied by an increase in the amount of glucose the cells take from the bloodstream, and he will say, "If we could somehow track glucose and measure its uptake by cells at work, we could get a picture of biological activity. We can track glucose through the body if we make the glucose radioactive." The teacher and students will then examine what radioactivity is and how half-life determines its duration.

The Vision

From the beginning of this performance learning task, the teacher and students will focus on the final presentation performance in which the students will report research results to their classmates and demonstrate an activity to teach another class the concept of half-life. Reports presented in television newsmagazine programs often summarize extensive research and interviewing, and students can use these productions as models for their own research reports. The teacher may show video clips of a few such reports and ask students to analyze and discuss techniques the professionals used to convey their information. A list of these techniques might include the use of photos, graphics, interview clips, and effective presentation skills.

The teacher might decide that this is a good time to introduce the concept of value-laden statements. As students watch the video clips, they could listen for statements that pack emotional influence and record those value-laden statements. During the follow-up discussion, the teacher will ask students to share their examples with the rest of the class. As a student gives an example, he or she will identify the words that have the strongest emotional connections, describe those connections as positive or negative, and tell whether he or she believes that the values conveyed in the statement align with the realities presented in the news report.

To establish a vision of the importance of effective classroom experiences, the teacher might say, "I have a very good friend who works in medicine who struggled long and hard to comprehend the half-life concept. When I told him what we were going to be doing in class, he said, 'If I had learned about half-life the way your students will, I would have understood it from the start and felt much more comfortable with nuclear medicine as a result.' If you can understand this one concept well enough to teach it to other students, you will have a firm grasp on the foundations of nuclear science."

To answer students' unspoken questions about using a performance learning task to master the concept of half-life, the teacher will give them these statements about learning.

> "People learn . . .
> 10 percent of what they read
> 20 percent of what they hear
> 30 percent of what they see
> 50 percent of what they both see and hear
> 70 percent of what they say as they talk
> 90 percent of what they say as they do a thing" (Ekwall and Shanker 1988, 370)
> and 95 percent of what they teach to someone else
> (Glasser 1990).

The teacher will suggest that students remember this list as they prepare their oral reports about radioisotopes and plan how to teach another group of students about half-life.

The Standards

Students will be learning to do a wide variety of tasks in this example of performance learning. They will learn the concept of half-life and teach it to other students, analyze the effect of biased or value-laden statements on attitudes toward nuclear science, and investigate common applications of nuclear science. The steps in the performance learning task and the curriculum standards are detailed in the task development chart (see fig. 10.1).

Students will produce and analyze graphs using half-life data, research uses of radioisotopes, use known half-lives to match radioisotopes to extended-time or short-term events and usefulness in dating artifacts, and plan and teach the concept of half-life to other students. As they work, they will want to compare their performances with the descriptions in the performance rubric (see fig. 10.2) for the task so that they can improve the quality of their demonstration of learning. Each student will receive a copy of the performance rubric early in the performance learning task.

Task Development Chart: Half-Life in World Life

Performance Tasks	Developmental Levels	Curriculum Standards
Do the stand/sit activity; analyze the information. Each Student: Personally define half-life and radioactive clock; explain how a radioisotope acts as a clock. Describe what happens during radioactive decay and identify alpha, beta, positron, and gamma radiation.	***Novice*** "If half is gone in one half-life, the whole is gone in two!" Can't match radioactive clock to the job; wants to use a short half-life isotope to date 10,000-year-old samples or long half-life for thyroid scans. Knows that all nuclear science is bad.	***Science*** Analyze and explain the atomic and nuclear structure of matter. Explain concept of half-life in own words. Explain the comment that half-life allows the use of radioisotopes as clocks. Identify some medical, food preservation, or home applications of nuclear science. Apply the half-life concept by choosing radioactive clocks with appropriate half-lives for studying short-term or extended-time events.
Do ribbon fold-cut activity and graph. Create half-life graphs using data from work with actual radioisotopes, pennies, or other materials or create half-life graphs using data provided by the teacher.	***Advanced Beginner*** "If half is gone in one half-life, some is left in two, but I'm not sure how much or why." Accepts some applications of nuclear science, such as carbon-14 dating: "It's there anyway, so use it." Makes a poor match between radioactive clock and job 50% of time.	***Mathematics*** Use half-life data to construct graphs that picture decay of radioisotopes. Use decay graphs to predict the level of radioactivity present in a sample at different times. Use ratios of activity levels to demonstrate the concept of half-life.
Do the team stand/sit activity in which each team represents a different radioisotope. Calculate the length of time required for a given number of half-lives. Pick appropriate radioactive clocks for short-term or extended-time applications.	***Competent User*** Repeats memorized definition of half-life and uses it mechanically. Accepts nuclear medicine and archaeological dating; does not trust irradiation or other nuclear science applications. Picks appropriate radioactive clock for job every time.	***Language Arts*** Analyze writings about applications of nuclear science for value-laden statements. Decide if a value-laden statement reflects scientific realities. Explain the concept of half-life clearly. Deliver an oral report that accurately conveys the results of research on a radioisotope.
Teams: Research the use of specific radioisotopes in nuclear medicine. Teams: Prepare the report to the class. Each Student: Collect and analyze value-laden statement examples.	***Proficient Performer*** Applies memorized definitions and skills well. States definitions in own words with difficulty. Examines statements about applications of nuclear science for value-laden statements; analyzes the effect of those statements on personal attitudes. Picks appropriate radioactive clock for job every time.	***Social Studies*** Evaluate public opinion toward uses of nuclear science. Analyze positive and negative aspects of various uses of nuclear science.
Teams: Present medical radioisotope reports to the class. Whole Class: Practice and present a half-life role play to another group of students to teach them the concept of half-life.	***Expert*** Defines terms clearly and in own words; explains concepts clearly. Analyzes scientific realities and forms own opinions. Examines and explains value-laden statements made by others. Matches radioactive clocks with tasks and explains the match so others understand.	

Figure 10.1

Performance Rubric: Half-Life in World Life

Developmental Level Performance	Decayed	Alpha	Beta	Gamma	Cosmic
Demonstrate Knowledge of Half-Life	Can't define or explain any terms. Thinks half-life is 12 hours of every day and radioactive clock is the snooze alarm on a bedside radio.	Recites a memorized definition of half-life. Can't explain use to time or date. Can't illustrate with an example.	Recites and explains a memorized definition. Describes clocklike attributes of radioisotopes. Applies half-life to match isotope to use.	Recites and explains a memorized definition. Describes clocklike attributes of radioisotopes. Applies half-life to match isotope to use.	Defines and explains half-life in own words and with analogies. Describes clocklike attributes of radioisotopes. Applies half-life to match isotope to use.
Graph and Calculate	Demonstrates no graphing skills: can't set up axes, plot points, draw lines or curves. Calculates inaccurately; doesn't check answers for reasonableness.	Demonstrates weak graphing skills: axes are okay, points may be incorrectly positioned, "connect the dots." Calculates correctly 50% of time.	Demonstrates adequate graphing skills: good axes, positioning of points, locates straight lines well but not curves. Calculates correctly 75% of time.	Demonstrates strong graphing skills: good axes, point plotting, and location of "best line or curve fit." Calculates almost always correctly.	Demonstrates strong graphing skills: good axes, point plotting, location of "best line or curve fit." Uses graphs to generate new data. Calculates correctly always.
Analyze Bias in Statements	Thinks in value-laden statements without recognizing them. Doesn't allow realities to interfere with emotions. Doesn't recognize others' points of view.	Thinks in value-laden statements; knows it, believes it's okay. May not acknowledge some realities. Doesn't recognize others' points of view.	Looks for neutral ways to express information 50% of time. Acknowledges reality and may disagree. Argues with others' points of view.	Chooses when to be neutral and when to use value-laden statements. Acknowledges realities and defends disagreements. Argues with others' points of view.	Chooses when to be neutral and when to use value-laden statements. Says, "I see, I think" instead of "You know, it's obvious." Explains disagreements with realities. Listens to others' points of view with empathy.
Produce Newsmagazine	Uses single presenter. Acts like a "talking head." Omits graphics and role play. Can't expand on script to answer questions.	Uses single narrator. Presents one poster or transparency. Omits role play. Repeats former statements to answer questions.	Alternates narrator with other "reporters." Uses several posters or transparencies. Provides additional facts in answers to questions.	Narrates by panel. Uses several posters or transparencies. Answers questions by giving new information and making connections.	Alternates narrator with role play and panel. Uses several posters and transparencies. Answers questions by making connections to other applications.
Participate in Teaching Demonstration	Lectures for entire time. Conveys message of "read the book!"	Lectures and demonstrates. Demonstrates "see and hear." Conveys message of "I'll read the book to you."	Lectures, demonstrates, uses think-pair-share. Demonstrates "see, hear, and discuss." Conveys message of "talk it over, tell it in your own words."	Directs activity. Demonstrates "see, hear, do, and discuss." Conveys message of "experience it, retell it."	Directs activity with switch in roles. Demonstrates "see, hear, do, discuss, and teach." Conveys message of "reorganize it, teach it."

Figure 10.2

The Coaching Context

Modeling Half-Life

The teacher will begin the introduction to half-life by asking students to stand in a large circle. Near the circle, he will hang a clock with a sweep second hand. He will pass a pack of number cards around the circle and say, "Each of you will take one card from the pack. On your card there is a number. I'll explain what these numbers mean as soon as each of you has a card." The teacher will have selected cards for the pack so that half of the students in the circle get cards with a face value of one, one-fourth of the students get cards with a face value of two, one-eighth of the students get threes, and so on. In a class of twenty-four students, for example, twelve will receive a "one" card, six students will get a "two," three will get a "three," and two will get a "four."

The teacher will give these instructions: "Watch the second hand on the clock. Note where it is when I say 'start.' After several seconds, I will say, 'Ones, sit.' When you hear that signal, if you have a card with a one, sit down, write down how many seconds passed between the *start* and the *ones, sit,* and count the number of students who are still standing. Record that number.

"After several more seconds, I will say, 'Twos, sit.' If you have a card with a two, sit, count, and record the number of students still standing and note and record the total time since I said 'start.' We'll continue with 'threes sit,' 'fours sit,' and so on until only one of you is still standing."

The teacher will answer any questions the students have about the process. Then the teacher and students will do the stand/sit activity. If the teacher and students believe that the activity did not go smoothly, they will talk about what went well and what needs to be improved and repeat the process. When students and teacher are satisfied that the activity was well done and only one student is still standing, the teacher will say to that student, "I'm finished giving instructions. And you're still standing. When do you think you get to sit down? When do you think you will sit down?" The student will possibly answer, "When I'm tired of standing." If the student does not think of this answer, the teacher will suggest it and then say to the class, "Remember that answer. We'll want to come back to it at a later time."

Analyzing the Information

Next, the teacher will ask students to set up a chart in their class notebooks to record data (see fig. 10.3). Students who counted how many others were standing will help with the last column. Everyone in the class can help with the Elapsed Time column. With the information filled in, the chart could look like the one shown in figure 10.4.

Reference Point	Elapsed Time (seconds)	Number of Standees
A: Start	0	24
B: Ones Sit		
C: Twos Sit		
D: Threes Sit		
E: Fours Sit		
And?		

Figure 10.3

Reference Point	Elapsed Time (seconds)	Number of Standees
A: Start	0	24
B: Ones Sit	30	12
C: Twos Sit	60	6
D: Threes Sit	90	3
E: Fours Sit	120	1
And?	"When she gets tired"	0

Figure 10.4

The teacher will say, "Look at that information. I think we may have some kind of pattern here," and will ask students to make a new chart. He will tell students to calculate the interval time by using the "elapsed time" numbers from the chart, so "B to A" has an interval time of 30 seconds minus zero, which is thirty seconds. The teacher will instruct students to reduce the "standee ratio" to the simplest whole number ratio they can find. This makes the "B to A standee ratio" reduce from 12:24 to 1:2. The rest of the numbers fill in as shown in figure 10.5.

Interval	Interval Time (seconds)	Standee Ratio
B to A	30	12:24 = 1:2
C to B	30	6:12 = 1:2
D to C	30	3:6 = 1:2
E to D	30	1:3 = 1:3

Figure 10.5

The teacher will say, "Look at the interval times. They are all the same. Now look at the ratios. Except for the last one, they are all the same. At the end of every thirty seconds, the number of standees is one-half as great as it was at the beginning. *That's half-life.* We have a half-life for standing of thirty seconds. Radioisotopes have a half-life for radiation level. If the beginning level is twenty-four, after one half-life the level is twelve. After a second half-life, what will the new radiation level be? Look at your charts!" At least one student will say, "It will be six! The new level will be six!"

Picturing the Concept

Next, students will work in teams of four. After the teacher has made the team assignments, he will give each team two strips of paper package-decorating ribbon of equal length. Twenty centimeters could be a good starting length. The teacher will ask one member of each team to set up these axes on a sheet of graph paper (see fig. 10.6).

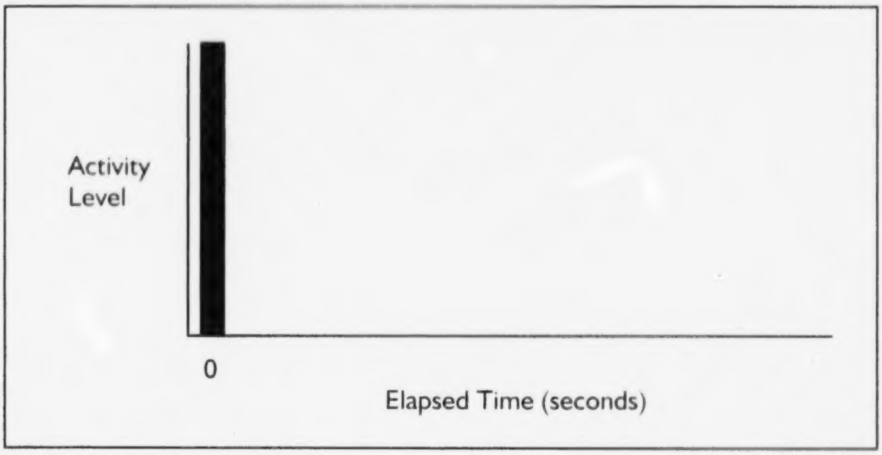


Figure 10.6

The team grapher will tape one strip of ribbon to the graph at time zero. The bottom end of the ribbon will touch the horizontal axis. Then the teacher will say, "One member of your team needs to be a timer who will watch the clock and record the elapsed time when I give the prompt *cut.* A second person will be the ribbon keeper. This person will fold the untaped piece of ribbon in half when I give a prompt *fold.* The final member of your team will be the cutter. This person will cut the ribbon at the fold, take one of the pieces from the keeper, and hand it to the grapher when I give the prompt *cut.*

"So here's how it will look" (matching action to words). "I'll say *fold*. The folder will do it. Some seconds later, I'll say *cut, fold*. The *cutter* will do his or her job, the grapher will take the piece from the cutter and label it B, C, D, or E, and the folder will make a new fold, dividing the piece of ribbon that he or she still has in half. The timer will keep track of the elapsed time in a chart like this one. Time zero is the time that I will give the first prompt to fold. A is the first cut-fold prompt. B is the second cut-fold and so on. Timer, remember, you want total time since the first time I said *fold*" (see fig. 10.7).

Reference Point	**Elapsed Time (seconds)**
A	none
B	30
C	60
D	90
E	120

Figure 10.7

"Let's do a dry run to smooth out any problems. Let me know when you get confused." The teacher and students will practice the moves without cutting the ribbon. When the students believe that the instructions are clear, they will do the exercise, cutting the ribbon.

The teacher will ask the timer and grapher to work together to decide on a time scale for the horizontal axis and to tape the strips of ribbon to the graph. The ribbon graph will look like the one shown in figure 10.8.

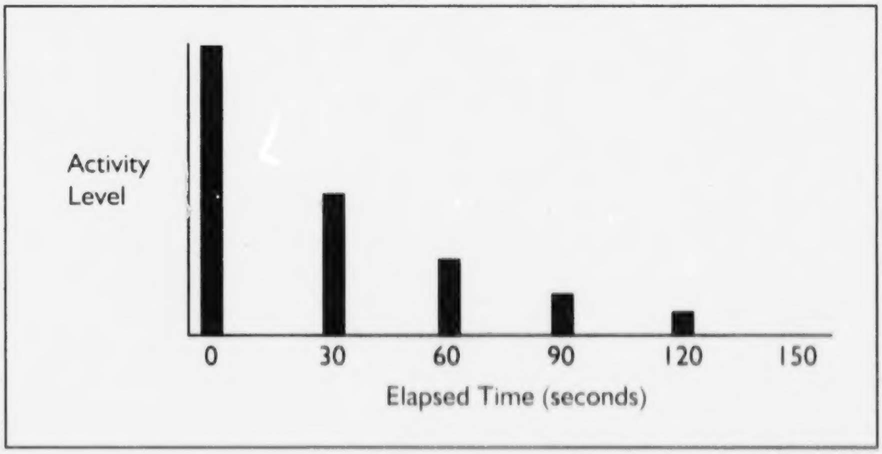


Figure 10.8

The teacher will ask his students, "What are we showing in this graph? What do we call the time interval between reference points? Is this another half-life demonstration?" Students will decide that yes, this is half-life because at the end of each interval the strip of ribbon that was cut off was one-half as long as the preceding strip and the time intervals are all the same. The graph could show the decrease in the activity of a radioisotope—it is a half-life graph.

Depending on the available equipment and facilities, students next might do an exercise to collect data from an actual radioisotope, graph that data, and compare the results with the ribbon graphs. Or they could do another simulation such as one found in chemistry texts (e.g., B.4: Laboratory Activity: Half-Life, in *ChemCom: Chemistry in the Community*, edited by H. Heikkinen, 1993).

The teacher will ask students to complete the graph by drawing the straight line or smooth curve that is the best fit to the points (the tops of the ribbons). He also may ask students to use the graph to generate new data. He may ask, for example, for the activity level after twenty or seventy-five seconds. Students can read this information from their half-life graphs.

Comparing Half-Lives of Radioisotopes

Teacher and students will work with using half-life to predict how much of a radioisotope remains at the end of different half-life periods. The teacher will model a new exercise. He will stand sixteen tall objects on his desk and say, "Suppose these represent the activity level in a radioisotope. If the half-life is ten seconds, how many objects will show the activity level after the first ten-second interval?" All of the students will probably be able to give the answer—at the end of one half-life, the activity will be one-half of its starting level—so the teacher will remove eight objects and have eight still standing.

The teacher then will say, "Now this is where things might get tricky. How many objects will show the activity level at the end of the next ten seconds?" He will give students time to figure out the answer, and he will encourage them to discuss their thinking with a partner. Students will agree, after they have a chance to think, that the answer is four. They need a value that is one-half of the activity level at the beginning of that interval. The number of objects standing on the teacher's desk then will go from eight to four and then from two to one, and the teacher will say, "Now, how long will this last object represent the activity level of this radioisotope? *Until it gets tired!* Just like the last atom remains until its nuclear forces get tired and it gives out the last bit of activity.

"Now it's time for you to figure out one on your own. I will divide the class into five teams. Each team will assume the identity of an assigned radioisotope. We will use a time scale of one second equals one day. You

Radioisotope	Half-Life (days)
Cobalt-48	71
Iron-59	46
Chromium-51	28
Strontium-85	64
Gold-198	3

Figure 10.9

will start with a radioactivity level of sixteen. Your job, as a team, is to decide how many seconds your radioisotope will need to reach a radioactivity level of one. How many half-lives is that?" Several students will probably answer, "That's four half-lives." The teacher will thank them for the correct answer and assign each team a radioisotope (see fig. 10.9).

Each team will calculate the time that its isotope will need to go through four half-lives. The teacher will check the calculations for accuracy and may ask teams that have incorrect answers to double-check their calculations or explain how they got their answers. The teacher will not reveal a correct answer to any team. He will coach and guide, letting teams determine the correct answers.

When all teams have done the calculations correctly, the teacher will say, "Everyone, please stand up. When I say *start*, begin timing. Remember, we're using a time scale of one second equals one day. When your radioisotope has reached that last atom, sit down. Watch who is standing and who is sitting. Ask yourself, What does that tell me about half-lives?" Teams will notice that half-lives vary from quite short to somewhat longer. The teacher will say, "We did have a variety of half-lives, yet none was really long. What if a team had been assigned carbon-14 with a half-life of 5,770 years? That's 565,750 days! How long would that team be standing if we use the one second to one day time scale? They'd be standing for about 395 days. Would we want them to be expected to stand that long? That's a very long time to stand; then again, it's a very long half-life."

The teacher can use this information to lead into a discussion of how the atomic clock represented by each isotope is used in practical applications. Radioisotopes with short half-lives are preferred in nuclear medicine if the substance is to be introduced into the patient. A short half-life means that the radioisotope's activity level in the patient will drop to almost zero fairly quickly. The very long half-life of carbon-14 makes it very useful in dating prehistoric bones or early human artifacts. The very long half-life means that significant levels of activity will exist over an extended time.

Nuclear Medicine

Each isotope team will research the role of its radioisotope in nuclear medicine. Students can obtain excellent background information about radioactivity and half-life from a variety of websites, including the following:

- http://zebu.uoregon.edu/~soper/Earth/radioactivity.html
- http://hep.uchicago.edu/~covault/97/atom_concepts.html (calculations involving half-life)
- http://www.chem.wsu.edu/phs298/RadioAct.html
- http://www.ccr.jussieu.fr/radioactivite/english/accueil.htm (French site developed for the centennial of the discovery of radioactivity)

Information about nuclear medicine is available at the following:

- http://vh.radiology.uiowa.edu/Welcome/UIHC/UIHCMedDepts/DiagnosticRadiology/Teleradiology/Tele.html
- http://www.vh.org/Patients/IHB/Rad/NucMed/PatGuideNucMed/PatGuideNucMed.html
- http://www.vh.org/Beyond/outsideLinks.html#1
- http://www.crump.ucla.edu/NM_Mediabook/
- http://fas.sfu.ca/css/update/vol1/1.1-harrop.html

Student teams will research the uses and roles of radioisotopes in medicine. As team members collect information from print or Internet sources, they will analyze the sources for bias, positive or negative, and they will decide how the bias of a source affects their feelings about the medical use of the radioisotope. Teams will use a television newsmagazine format to report the results of their research to the class. Teams will include their conclusions about the influence of value-laden or biased statements on attitudes toward nuclear medicine in these reports.

The Teaching Activity

The teacher and students will plan an exercise to teach other students about half-life. Students may decide to revisit the stand up/sit down activity the teacher used to introduce them to this concept, rehearse the instructions and movements, use the activity to demonstrate half-life to another group of students, and then lead those students in doing the activity. The entire class will act together to plan and rehearse this presentation performance of their learning.

The Presentation

For its in-class presentation performance, each team will deliver a report, using the television newsmagazine format, to the class that conveys the results of its research on its radioisotope. The report will include information about the use of the isotope in nuclear medicine, the diseases or disorders diagnosed or treated by use of the isotope, the affected organs or body systems, how long the use of the isotope has been practiced, alternatives to using the radioisotope, and the benefits and the drawbacks of these nuclear medicine techniques.

One member of the team will narrate the isotope report, and others may role-play doctors, patients, technicians, or others involved in the nuclear medicine application. The presentation report may include role-play interviews involving the narrator, a variety of nuclear medicine characters, and the "person on the street." Team members will prepare visual aids for the narrator to use. These visual aids may include posters, overhead projector transparencies, and brochures or pamphlets. The team will report its conclusions about the effect of value-laden statements on public attitudes toward this nuclear medicine technique, and each team will be prepared to answer classmates' questions.

In addition to the in-class presentation performance, the entire class will select and plan an exercise to teach another group of students the half-life concept. The class may decide to use the stand/sit activity they did to model half-life or they may choose some other activity. Whatever they choose, they will fine-tune their performance with the help of the performance rubric and with advice from the teacher. The teacher will make arrangements for an audience for this portion of the presentation performance.

After the class has worked with the audience, each audience member will write a personal definition of half-life and will include an example that demonstrates the half-life concept. When the teams return to their own classroom, the teacher will give each team some of the audience's definitions. Teams will read what audience members have written and test the audience definitions against their own understanding of half-life to evaluate the effectiveness of their teaching.

The Reflection

Using the analysis of the audience definitions as supporting evidence, each team will work together to answer an adaptation of Mrs. Potter's questions. Each student will also compose a personal journal entry using a sentence starter. This journal entry may help students clarify their own thinking and feelings about this often controversial topic.

Reflection

TEAM REFLECTION

Mrs. Potter and Half-Life

For our presentation to another class, we were asked to . . .

What we did well and our supporting evidence:

What we would improve next time and our supporting evidence:

The help we believe we need and where we can get it:

What we learned about teaching and learning:

INDIVIDUAL REFLECTION

Personal Journal Entry

The *two* colors I would choose to represent nuclear science applications are . . .

because . . . [three reasons for choosing each color or this combination of colors]

Chapter 11

The Heart-Smart Gourmet

The Performance

Apprentice chefs learn their cooking skills as they work in the kitchen, preparing food with the help and encouragement of cooking masters. As chefs mince, chop, measure, and blend, they create procedural memories—automatic sequences of movements and skills that are difficult to learn and hard to forget (Sylwester 1995). Their movements become quick, efficient, and seemingly effortless. As their skills progress, they become unaware of many of the separate steps involved in the sequence of their movements. In their brains, many separate, small movements form larger memory chunks. They can tell stories, carry on conversations, or plan ahead for the next step in the process as their muscles carry out the actions needed to do a food preparation task.

Preparing food using fresh ingredients involves lifelong skills in which most students can become proficient performers. As students combine these cooking skills with heart-smart choices of ingredients, they develop the capability to maintain enjoyable, healthful diets. In this performance learning task, students will learn cooking skills frequently used in making everyday meals. As they prepare different recipes to practice the basic skills, students will collect information about heart-smart eating and plan a menu for a heart-smart buffet. Student menu teams will write and perform a script for a cooking show in which team members explain and demonstrate how to prepare a heart-healthy recipe. Students will celebrate their knowledge of menu planning and cooking skills by preparing and sharing a heart-healthy luncheon buffet with invited guests.

The Prompt

The teacher may choose to introduce this performance learning task to students by telling a story about a poor cook. Many people know a story about someone who cooks so badly that he or she once put a frozen pizza in the oven without removing the packaging. Another poor cook story could involve someone who read the instruction, "Mix by hand," and plunged his or her fingers into the mixture, not realizing that the instruction really meant to stir with a spoon instead of using an electric mixer. Students will laugh at these stories, perhaps knowing they could make these types of mistakes themselves.

The teacher could introduce this task by asking students to stand and then saying, "Please sit down when the food preparation task I name represents the most complicated food preparation you have ever done: putting ice cream in a dish, opening a bag of potato chips, making toaster pastry, making toast without burning it, cooking frozen pizza, heating canned soup, preparing a cake from a mix, preparing mashed potatoes from fresh ones, making soup from fresh ingredients, making a cake from scratch."

When all the students are sitting, the teacher will tell them that each one of them will be able to do many, if not all, of the tasks she named by the time they complete this performance learning task. At this time, the teacher also will encourage students to begin thinking about making heart-healthy food choices. She may survey the class, asking students to raise their hands if they know someone who has been diagnosed with high blood pressure, high cholesterol, irregular heartbeat, or a pulse rate that is very slow or very fast. She will suggest that heart-healthy diets can help many individuals remediate these problems and can include many enjoyable foods.

Students and teacher will discuss the presentation performance for this task. The teacher will tell the students that they will be presenting cooking programs to each other and preparing an end-of-task luncheon buffet for themselves and a survey group of students from outside the class. Teams of students will write scripts for segments of a class production, "The Heart-Smart Chef," and each team will perform its cooking demonstration for the rest of the class. Each team will prepare its presentation recipe and a few other dishes for the final luncheon buffet. The student chefs will ask members of the survey group to rate buffet items, telling which items were their favorites and which they would be least likely to want to eat again.

The Vision

A number of master chefs have their own television programs or appear on home-style programs such as "Martha Stewart Living." The Discovery Channel, Lifetime, and Public Television feature programs such as "Great Chefs" and "Baking with Julia." To give students examples of excellent cooking show performances, the teacher will show several video clips from these or other cooking programs and ask students to watch how easily the chefs prepare food as they explain what they are doing to a studio audience or the camera. Students will notice that these camera-wise chefs are able to stay close to the script without reading every line and ad-lib to explain the unexpected. Students also may comment on the organization of the show. Most chefs have ingredients already measured and ready to use so they can prepare several dishes in a thirty-minute program. Many chefs work with partners or assistants who clear away used dishes, pans, and utensils and make sure the clean ones needed for the next step or recipe are available. The chef or staff of the television program often writes recipes on large cue cards and uses these as visuals at the end of the program. Watching these master chefs perform for the camera will help student teams prepare quality food programs of their own.

Seeing the master chefs work will also help students associate some cooking actions with the words used to describe them. Many recipes that chefs demonstrate involve mincing, sautéing, simmering, dicing, blending, and other specific cooking techniques. Students who are unfamiliar with cooking skills will appreciate seeing these skills demonstrated by experts before they attempt to perform them. The video clips will show students what some cooking processes look like when they are done correctly. The teacher may also want to provide samples of food prepared by experts so that students can experience the taste of good cooking. The teacher and students can pool their funds to purchase samples of expertly cooked food or the teacher can locate funding from other sources.

The Standards

In this performance learning task, students will learn how to plan heart-smart menus while they practice cooking skills. The entire class will do menu planning; students will work in kitchen teams to learn cooking skills and in menu teams to write, polish, and perform cooking show scripts. Each menu team will prepare food for the final luncheon buffet. Curriculum standards from several areas weave together in this complex task. The standards and steps in skill development are outlined in the task development chart (see fig. 11.1).

As students practice their cooking and menu planning skills, revise their scripts, and prepare the luncheon, they will want to use the performance rubric (see fig. 11.2) for the task to evaluate their performance level for each phase of the task. Students can use the rubric to decide what they are doing well and what they want to target for improvement. Remembering that the final presentation performance involves both the cooking show and the buffet, students will want to use the rubric to keep track of all of the components of this performance learning task.

Task Development Chart: The Heart-Smart Gourmet

Performance Tasks	Developmental Levels	Curriculum Standards
Learn food preparation skills. Watch video clips of skilled chefs in action to fit actions to descriptions. Practice cooking skills in kitchen teams. Learn safe and sanitary ways of handling, storing, preparing, and serving food and cleaning up the kitchen.	***Novice*** Eats impulsively: eats whatever he or she sees first and eats fast. Doesn't know about fat grams or vitamins and doesn't care. Acts dangerously in the kitchen, especially with sharp tools! Cooks frozen pizza in the box.	***Family and Consumer Studies*** Demonstrate a variety of food preparation techniques. Plan daily menus that promote wellness. Handle, prepare, serve, and store food using safe and sanitary techniques. Explain connections between diet and health. Use label information to select heart-healthy foods.
Investigate principles of heart-smart eating. Learn about the food pyramid guide for making food choices. Find heart-smart recipes for the class to test. Kitchen Teams: Prepare and sample selected recipes.	***Advanced Beginner*** Considers a few options before making food choices. Goes for what's fast or convenient. Sometimes, but not often, thinks about what's in food. Makes toast and simple sandwiches, heats canned soup, and prepares frozen entrees.	***Language Arts*** Write a clear, precise script for a cooking demonstration. Make appropriate, impromptu changes in the script during the performance. Keep a personal notebook of learnings and applications.
Form menu teams and get menu team assignments. Brainstorm food preparation script. Decide on cooking show roles. Test and revise scripts. Make cue cards, posters, and transparencies.	***Competent User*** Uses fresh ingredients and eats "healthy" when time permits. Falls back to fast and convenient food when time is limited. Makes salads and cooks fresh meat or fish; uses fresh fruits and vegetables.	***Mathematics*** Use ratio and proportion to scale recipes up or down.
Do the cooking show performances. Give positive feedback to each team. Presenting Team: Reflect on performance and cooking results; plan cooking improvements for the class buffet.	***Proficient Performer*** Varies ingredients for an interesting diet. Makes most heart-healthy choices automatically. Finds heart-smart fast food (or fast preparation) choices. Reads, interprets, and prepares most recipes easily and well.	***Visual Arts*** Use visual elements of color, perspective, patterns, spacing, and color scheme to design posters and menus.
Scale up recipes to amounts needed for buffet. Request cafeteria-size cooking utensils. Set up the room; prepare the food. Serve the buffet. Collect and analyze student ratings of buffet items. Reflect on results; plan improvements for next time.	***Expert*** Looks for new and different fresh ingredients when grocery shopping and chooses heart-smart items. Stocks pantry and refrigerator with heart-smart food choices. Invents own variations on traditional recipes to make them more heart-healthy. Motto: Nothing is forbidden except excess.	***Social Studies*** Compare differences in diet among various world cultures. Describe the ways in which physical geography and climate affect food resources in various world regions.

Figure 11.1

Performance Rubric: The Heart-Smart Gourmet

Developmental Level Performance	Inedible	Digestible	Tasty	Delicious	Incredible
Use Cooking Skills	Can't identify uses of cooking utensils. Can't chop, dice, mince, blend, or toss. Burns toaster pastry. Cooks frozen pizza in the box.	Uses low-skill items well: toaster, bread maker, refrigerator. Slices well; doesn't chop or mince. Removes frozen entree from box before cooking.	Uses mixer, food processor, microwave, oven well. Slices, chops, and minces. Follows simple recipes easily.	Uses all kitchen tools and appliances appropriately and easily. Chops, slices, blends, and mixes well. Uses multistep recipes skillfully.	Chooses the right tool for the job in the kitchen. Performs any food preparation task easily and well. Scales recipes up or down, sometimes "in one's head." Creates own recipes.
Prepare Food	Cardboard tastes better. Cardboard is easier to chew. "Give me the cardboard."	Prepares food that doesn't taste bad, just doesn't taste like much. Prepares food that is sometimes chewy or hard. "With this I won't starve."	Prepares digestible food. Prepares food that's a little bland but overall okay. Prepares easy-to-chew food. "I'd have this again."	Prepares food with good, interesting flavor. Prepares tender, flaky, crunchy food with good texture. "Give this to me again."	Prepares food with rich, full, interesting flavor. Prepares out-of-the-ordinary food. Makes food with wonderful texture: the mouth feels what the brain expects. "I really want this recipe!"
Make Heart-Smart Choices	Heart-smart: • Knows something about fat. • Knows something about fiber. That's all I know. Does it really matter?	Knows fats and meat are bad. Knows fruits and vegetables are good. Does not offer much choice or menu excitement. Boring!	Watches amounts of animal fats. Knows some vegetable oils are okay. Uses lots of fruits and veggies. Knows a little meat is okay. Knows seasonings add interest.	Watches for saturated fat. Knows olive oil is good. Knows fruits, veggies, and fish are good choices. Substitutes beans for meat for variety. Explores spices and seasonings.	Uses the food pyramid to guide menu choices. Knows fresh ingredients have more of what the body wants. Uses exercise to help diet. Follows "the only forbidden is the bad tasting or excessive."
Design Cooking Show	Creates sketchy script; omits many important details. Gives no safety and sanitary details. Couldn't prepare the dish using the script as a learning tool. Uses no visuals.	Covers the basics but not how to cover problems. Produces something edible. Provides no sanitary and safety details. Uses no visuals.	Produces the expected food. Emphasizes cooking temperatures. Creates black and white poster with recipe.	Covers the recipe, "what ifs," and how to handle food and clean up properly. Creates black and white poster with recipes plus a transparency with cooking tips.	Uses great script! Provides necessary information for troubleshooting recipe and having a safe, clean kitchen. Uses poster with recipe and color illustration, plus cooking tips transparency.
Participate in Cooking Show	Uses one chef for all the cooking. Reads the cue cards line for line. Doesn't use improvisation to cover the unexpected. Acts uncomfortable in the kitchen.	Shares the cooking with two chefs. Does not deviate from cue cards. Uses no improvisation. Acts uncomfortable in the kitchen.	Alternates chefs. Improvises to cover bloopers and blunders. Acts comfortable with mistakes. Acts mechanical in the kitchen.	Alternates chefs. Uses self-directed humor to cover blunders. Acts comfortable and confident in the kitchen.	Alternates chefs; interacts and cooperates well. Acts comfortable with and funny about blunders. Acts confident and adept in the kitchen.

Figure 11.2

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The Coaching Context

Apprentice Chefs

As students begin this performance learning task, they will watch expert performances and practice using some basic cooking skills. The teacher will demonstrate specific techniques for students to show them how to do the work and to provide a live model for the final cooking show performance that students will be doing. To practice their cooking skills, students will need access to a kitchen work area. A foods lab classroom is the ideal learning environment for developing proficiency in using cooking techniques.

As students practice their food preparation skills, the teacher will stress the need for safe, sanitary handling, storage, and service of food. She will show students how to keep work areas sanitary, tell them which cleaning products are needed for thorough cleaning and sanitizing of work areas, and give tips on other areas of concern such as safe temperatures for storing cold foods or temperatures at which hot foods can be considered ready to serve. The teacher will remind students that personal hygiene habits such as hand washing and covering sneezes are an integral part of kitchen hygiene as well. Students will have many opportunities to practice food preparation skills as they do the various parts of this performance learning task.

Learning Heart-Smart Menu Planning

Information on healthy eating habits is available from many types of sources. Heart-healthy eating and menu planning are frequent topics for newspaper food columns and health segments of newsmagazine programs. Several websites provide information about menu planning using the food pyramid advocated by the United States Department of Agriculture and professional dietitians. As students become better cooks, they will discover many other sources of information about heart-smart eating.

The food pyramid guide to food choices is a helpful tool for students planning their heart-smart menus. A website with the food pyramid and a servings guide is <http://babybag.com/articles/fdapyrmd.htm>. More complete information about each of the food groups is available at <http://www.med.virginia.edu/medcntr/depts/patient-ed/consumer/hrthlthy.html>.

Other websites containing good information about heart-smart eating that students will be able to use in planning their menus are

- http://www.sk.sympatico.ca:80/healthyway/HEALTHYWAY/rec_hrt.html (contains many sections with a variety of helpful pointers about heart-smart eating)
- http://www.heartinfo.org (contains links to many other websites)
- http://www.geocities.com/Athens/Forum/3307/recipe.html (contains entree recipes)

The school or town library may contain cookbooks with menus and tips from chefs and cardiac health professionals such as Dr. Denton Cooley, the heart-transplant pioneer.

The entire class will use the information acquired about heart-smart menus to select dishes to prepare for the luncheon buffet. Students will read recipes carefully to identify the food preparation skills that each recipe requires. They will learn unfamiliar skills and polish the skills they have already practiced. The teacher will help students plan a buffet menu. The buffet could include appetizers containing vegetables, fruits, grains (in bread or crackers), and cheeses. Several vegetable and fruit salads might be prepared. The entrees could contain meat, fish, or beans and be accompanied by a variety of breads, rice, or pasta and several vegetable choices. Desserts could include fruit, milk, or yogurt products and carefully chosen baked items. When the students and teacher have decided which recipes they want to prepare, the teacher will arrange for the purchase and distribution of all necessary ingredients.

The teacher will assign students to kitchen teams in which they will practice their cooking skills as they test recipes for dishes that could be included in the buffet. After students have had an opportunity to test at least four recipes in each category, the students and teacher will decide on the buffet menu.

Foods in Other Cultures

As students learn more about heart-smart eating, they may encounter articles or information suggesting that some cultures have heart-healthier diets than other cultures. Students will collect information about the diets of a variety of cultures and the overall cardiac health associated with these cultures. The teacher will encourage students to explore the effects that climate and geography may have on the diet of a particular culture and to explore the role of exercise in overall fitness. Students may decide they want to sample some of the heart-healthy foods used in other cultures. The teacher may make arrangements to bring samples of some of these foods into the class, or she may help students locate ethnic restaurants or food markets so they can explore these cuisines on their own.

The Television Series

Small menu teams of students will present the cooking demonstrations. The teacher will divide the class into six menu teams, one for each category of items included on the buffet menu. Each menu team will write a script for a cooking program demonstrating how to cook one of the buffet items. The teacher may assign a buffet item to each team, or teams may draw their recipes at random. All of the students in the class will have prepared all of the recipes, so no menu team will be doing unfamiliar work. After teammates have had a chance to do a trust-building exercise, the teacher will ask them to decide roles for the cooking show production: the producer who keeps the team focused and on task and organizes the set for the cooking demonstration, the director who guides the action during the demonstration and organizes the cue cards, and the chefs who do the cooking and help each other assemble the prepared menu item. Teammates will divide roles and brainstorm a script.

Each team will walk through the performance to see how well the script works. The teams will use actual kitchen implements and utensils during the walk-through. The only part of the real cooking task that will be missing will be the food. At each step of the rehearsal, teammates will check the chefs' actions against the reality of preparing the food to see if the script accurately describes the cooking process. As the teams find problems in the script, they will revise the text and test it again. The teams will check the script to be certain it includes all necessary instructions about food handling safety. Once a team is satisfied with its script, teammates will help the director plan and write the cue cards and prepare posters or transparencies to use as visual aids in the cooking demonstration.

Planning the Luncheon

Students and teacher will decide who they want to invite to the presentation buffet. They may invite parents or school administrators. They will invite other students, and they will tell these students that they will form a survey group that will rate the buffet items and tell the chefs which items they liked best and their reasons for their choices.

The student chefs will give information about the importance of heart-smart eating to members of the survey group several days prior to the buffet luncheon, and the student chefs will ask members of the survey group to come to the buffet prepared to taste every dish on the buffet and to give accurate ratings.

Student chefs will design and produce an invitation (see fig. 11.3).

You are invited to share in
a special buffet prepared by
The Heart-Smart Chefs
in the foods lab at
Julia Child School.

Friday, January 15, 1999
at 12:30 pm
RSVP by Monday, January 11

Figure 11.3

Students will know how many servings of each dish the basic recipes provide. They will use ratio and proportion to scale up each recipe so they can prepare enough food to serve everyone who is invited to the luncheon buffet. The teacher will arrange funding for the buffet. A parent-teacher organization may help with food costs, or the school budget may contain funds for this type of event. As soon as the teacher and students know how many guests to expect, students will do the final calculations for each ingredient needed, and the teacher and a student committee will go to a grocery store to select and purchase the food.

Each team will be in charge of preparing the recipe it demonstrated in its cooking program. To actually prepare the food for the luncheon, students may need to borrow mixing or cooking items from the school kitchen. The teacher will make arrangements to borrow any necessary items well in advance of the luncheon date to ensure the availability of all of the equipment that her students need to prepare and serve the luncheon.

The students will design and make signs to label each dish on the buffet. In addition to the dish's name, students may want to list the main ingredients in a dish, tell the source of the original recipe, and identify the part of the food pyramid to which the main ingredients belong.

Students also will prepare a rating sheet that the survey group members will fill out and turn in before they leave the buffet (see fig. 11.4).

Name of Menu Item	0 Send This to the Landfill	2 Edible if Not Exciting	4 Awesome! Give Me More!	Comments
1.				
2.				
3.				
4.				
5.				
6.				

Figure 11.4

Each member of the survey group will take at least two small bites of each item on the buffet and indicate his or her opinion on the rating sheet. The entire survey group will meet before leaving the buffet luncheon, and group members will vote to determine their top three dishes.

The Presentation

Before menu teams perform their cooking demonstrations, the teacher and students will review the big picture for the class. The overall vision is that these programs will fit together in a series, "The Heart-Smart Kitchen." Each menu team will do a final script check and revision, emphasizing the ways in which its menu item contributes to a heart-healthy diet. The team may include information about fat content, the type of fat contained in the food, the antioxidants present in the ingredients, and how this menu item fits into a food pyramid diet plan. When this final check and edit has been completed, each menu team will present its cooking program to the rest of the class.

The producer will set out the utensils, mixing containers, and cooking pans the team needs to prepare the food. The director will take his or her place between the cooking area and the audience and will have the cue cards in order. The chefs will take turns explaining how to prepare the menu item. Chefs who are not actually doing the cooking will display transparencies and posters to illustrate the steps in the food preparation process. Because the cooking process contains elements that are hard to predict, each chef will be alert for times when he or she can best describe the action with impromptu comments. At the end of each program, the chefs will give each audience member a small food sample, and the audience members will taste the food and give the team positive feedback about its cooking skills.

After they do the cooking shows, menu teams will make the final selection of dishes to include on the buffet. During the morning of the luncheon, the students and teacher will set tables and prepare the room for their guests. Menu teams will prepare their buffet items, allowing ample time for preparing fresh ingredients and cooking foods. Each team will prepare three different dishes for the buffet. Teams that are preparing hot foods will have the food ready to serve twenty minutes after the guests are to arrive. This will allow time for guests to mingle and chat before they eat. Students who prepared a menu item will place that food on the buffet and refill the serving dish as needed. The teacher and students will all participate in cleanup after the guests are gone. Students will wash, dry, and return all borrowed items to the school kitchen. When the cleanup is finished, the students and teacher will take time to review and analyze the surveys and reflect on what they did well and what they have learned about heart-smart eating.

The Reflection

After serving the buffet, the student chefs will take time to look over the ways in which members of the survey group rated menu items. Student chefs will summarize information and comments about the menu items in a TNT chart (see fig. 11.5).

The teacher and students will discuss reasons why people may choose to eat in ways that are not heart-smart. Students will use the TNT chart to prepare a list of the features of a heart-smart dish that is likely to be popular with other students. The student chefs will see how well the "top three" dishes fit these criteria.

T	N	T
What menu items were TASTY? **Comments**	Which menu items were NASTY? **Comments**	What does this TELL us about choosing heart-smart foods?

Figure 11.5

As each menu team completes its cooking program presentation, the teammates will take time to reflect and process their performance by answering a series of team reflection questions.

Throughout the performance learning task, each student will keep a notebook of individual reflections and personal heart-healthy learnings and insights. Two notebook entries, one made near the beginning of the task and one near the end, will list everything the student ate during one day and will analyze how well the student's food choices align with the food pyramid suggestions. The student will compare these two entries and look for changes in personal eating choices. Students will periodically review their goals, assess progress toward those goals, and re-evaluate the heart healthiness of their food choices.

Reflection

TEAM REFLECTION

How did our cooking show performance demonstrate

- Our cooking skills?
- Our abilities to improvise?
- Our understanding of heart-smart eating?

What happened that was funny?

How well did we maintain our composure?

What did classmates like about our food?

What cooking skills do we want to improve before the buffet?

INDIVIDUAL REFLECTION

Final Notebook Entry

My personal top five discoveries about heart-smart food choices:

Discovery:	Reason for choosing this discovery:

One way my choice of foods is changing:

One future goal:

Chapter 12

A Special Holiday: AttaGram Day

AttaGram
For:
Way to GO!!!

The Performance

During the past few decades, a number of celebration days have evolved to accompany more traditional ones. On these celebration days, individuals give others messages and tokens of appreciation, congratulations, friendship, or love. These celebrations are often modeled on Valentine's Day, a celebration with a very long history. Other celebrations are Mother's Day and Father's Day, times when children demonstrate their love and appreciation for their parents by giving cards and flowers and, perhaps, taking mom or dad out for dinner. Various enterprises, noticing the effect that these celebrations had on the sales of goods, decided that creating a special day of appreciation and friendship could be an effective marketing strategy. In the United States, people now exchange tokens of friendship and recognition on Sweetest Day, Boss's Day, Teacher Appreciation Day, Secretary's Day, and other days.

As students do this performance learning task, they will form a company to produce "AttaGrams," cards that students can use to express friendship and appreciation for a classmate or to recognize and congratulate a classmate for a specific achievement or honor. This card-producing company will create and promote a day of celebration—"AttaGram Day," a day when students throughout the school will send each other AttaGrams they have personalized with messages of friendship, recognition for work well done, or congratulations for special achievements or honors.

The students in the production company, AttaGram, Inc., will conduct a market survey to select card designs, promote the holiday, sell and distribute the AttaGrams, and investigate the effect of nonprice factors on customer demand for a product. They will prepare and deliver a report to an audience composed of members of other classes in which they describe their business venture and its results. At the conclusion of this performance learning task, the teacher and students will brainstorm a list of popular prod-

AttaGram
For:
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ucts that have been in high demand and suggest the promotional path that might have led to the success of these products. The task will help students better understand one aspect of the free-enterprise system that exists in many developed nations.

In addition to helping students understand market economics, this performance learning task can create an improved climate for learning in the entire school. When students receive positive feedback about their performances, or when they receive encouraging words of friendship and belonging from other students or their teachers, their emotions become engaged in school in positive ways. Students see school as a place where they can be creative and take risks because people in the school like and accept them. These positive emotions result in the production of endorphins, the neurotransmitters that reduce pain and increase feelings of well-being. Sylwester (1995) says that these positive emotions drive attention, which drives memory and enhances learning. Caine and Caine (1991) say that positive emotional states result in expanded learning.

Students who believe in their ability to be successful in school, those whose are self-convincers who say, "Yes, I can!," are very likely to be engaged, successful learners. These self-convincers are produced in the midbrain region that is the seat of emotions, the limbic system (MacLean 1990). The AttaGrams that students receive from each other will provide the kinds of positive emotional experiences that can result in increased learning for every student in the school.

The Prompt

Students may not be aware of the number of special days that receive promotion and attention. The teacher will engage their curiosity by saying, "I've been wondering—other than Valentine's Day, Mother's Day, and Father's Day, what are some special occasion days for which people might send cards or flowers or do other special things for each other? Think about this for awhile. Ask your friends and family for ideas. Search the net for sites on appreciation days or holidays and special occasions and come to class tomorrow with some answers to share with the class."

The next day, the teacher will collect and record the ideas the students contribute. Then the teacher will ask, "Have you ever wondered about the origins of all of these special days? Who created them? Who benefits from their commercial existence?" After students have thought about the kinds of goods that are exchanged, they can develop a list of the types of companies that make and deliver these products. Then the teacher will tell students that they will be taking on the role of a company that creates a special holiday for which it produces and markets greeting cards. Students will hear that they will be doing a market survey to select card designs, promoting the holiday and selling the greeting cards, delivering the cards to the recipients, and preparing a report to stockholders in which they describe the business venture and its success. The teacher may want to ask students, "Why go to all of this work? Why not just read about Hallmark, American Greeting, or other greeting card companies?" Teacher and students will review the importance that active learning plays in developing long-term understanding.

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For:
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The presentation performance for this task will be the report to the stockholders, played by students from other classes in the school. The students who are a part of AttaGram, Inc. will want to brainstorm ideas about the components of a successful business presentation. Television programs and commercials depicting business presentations may help them suggest that they will need presentation charts and graphs, on poster-size paper or transparencies, and copies of the report for the stockholders. The students and teacher will want to review the elements of an effective oral presentation and may develop a presentation rubric such as the one shown in figure 12.1.

Presentation Rubric: Oral Report to the Stockholders

Developmental Level Performance	Boring	Bland	Wow!
Voice	Mumbles, mutters, speaks in monotone.	Uses clear, good volume; speaks in monotone.	Uses clear, good volume and expression.
Eyes	Focuses totally on notes.	Looks up from notes; sometimes detached.	Makes contact with various audience members; engages audience.
Demeanor	Acts stiff and stilted.	Acts stiff and nervous; makes small self-conscious moves.	Uses relaxed, natural gestures; acts calm.
Knowledge of Subject	Recites notes mechanically; doesn't hear errors.	Reads from notes; corrects reading errors; doesn't extemporize.	Uses notes as a a general guide; catches and self-corrects mistakes.

Figure 12.1

Students may use the rubric to self-evaluate and polish their skills before doing the oral presentation for this performance learning task.

AttaGram
For:
Way to GO!!!

The Vision

Students of all ages are targeted by advertising for many kinds of products. In any classroom, most of the students will be aware of the history of a number of high-demand products. The teacher and the students will brainstorm a list of these products, and the teacher will ask the students to analyze the factors that helped these products become so successful. Students will work in small teams to answer these questions:

- What kinds of advertising did the products receive?
- How did the manufacturers create interest in the products?
- How did the news media, intentionally or unintentionally, contribute to the success of the products?
- What, if anything, did the manufacturer do to create consumer competition for the product?
- How successful was that manipulation?
- What nonprice and nonpromotion factors contributed to the success of the products?

After teams have had a chance to discuss and answer the questions, the teacher will lead a whole-class discussion of the answers. Then the small teams will take some time to address these concerns:

- How can we help our company, AttaGram, Inc., be a commercial success?
- What actions of successful, everyday-world companies can we use?
- How can we maintain our vision of success as we do this performance task?

Students and teacher will use the answers to these questions to write a vision statement and a mission statement for AttaGram, Inc. and to develop a flowchart that outlines the operations of the company and the conditions that promote the success of those operations.

The Standards

Some commercial production companies go out of business before selling a single product item. Others are wild successes. The teacher will help students understand that between these two extremes are levels of development that form a continuous spectrum of business success. Each student will have a copy of these developmental levels to use as a reminder that success in using business skills, like all other skills, builds and grows through several developmental levels. Using this task development chart (see fig. 12.2), students also will see that business success involves using mathematics, language arts, visual arts, and sociology to enhance a knowledge of the economic system. Students will use the task development chart and the performance rubric (see fig. 12.3) for the performance learning task to keep track of their places in the commercial cycle and to self-evaluate progress toward developing a successful production and marketing company.

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For
Way to GO!!!

The Coaching Context

Incorporation

As the teacher leads the initial brainstorming and analyzing activities, he also will state very clearly that the performance learning task will involve forming and running AttaGram, Inc., a company that will manufacture, market, sell, and distribute greeting cards for members of the school community—teachers, students, staff, and administration—to send to each other. The sender of a card will include a personalized message to the receiver celebrating their friendship, thanking the receiver for something kind or helpful that he or she has done for the sender, congratulating the receiver on a personal success, or saying something such as "Thanks for being here. You add something unique to the life of our school."

To formalize this commercial start-up, the teacher and students may want to fill out a form registering the name of their business with a local government agency. Many local governments have a form called "Doing Business As . . . " that can be completed and filed for a small fee. This official registration of the business may give it more reality in the eyes of the students.

The teacher and students will write the vision and mission statements of their new company. They will discuss the company's target: to create a new special celebration day, "AttaGram Day," for which students, teachers, teacher aides, custodians, cooks, administrators, bus drivers, and other support staff can buy and personalize greeting AttaGrams. The shipping department of AttaGram, Inc. will ensure delivery of each card to its recipient on AttaGram Day. Small teams in the class, representing different company divisions, will prepare reports to the company stockholders. The teams will deliver these reports to students in other classes to let the stockholders know what the company does and how well it does it.

Creating a Celebration

The teacher will assign students to small teams and assign each team a specific division, or function, of the company: research, production, marketing, sales, shipping, and management. Each team will design and produce an advertising poster announcing the creation of a special celebration

Task Development Chart: A Special Holiday: AttaGram Day

Performance Tasks	Developmental Levels	Curriculum Standards
Form AttaGram, Inc. Receive team assignments. Create initial advertising. Explain special holiday and product to the rest of the school.	***Novice*** Does not connect demand with production decisions. Does not connect nonprice factors with demand. "Just wants stuff" without being aware of influence of marketing or advertising strategies.	***Social Studies*** Explain how procedures identify goods consumers will buy. Describe how nonprice factors (e.g., changes in consumer taste) can affect demand. Analyze techniques producers use (e.g., advertising, limiting supply, gifts, rebates) to influence price and demand. Identify the origins and meanings of several special occasions or holidays recognized in the community.
Create AttaGram prototypes. Design and distribute surveys. Analyze survey results and make production decisions. Print the AttaGrams.	***Advanced Beginner*** Does not know that companies survey consumers to make production decisions. Thinks price is the main factor influencing consumers. Watches ads for sales and rebate offers.	***Mathematics*** Design surveys and gather data to answer questions about consumer preferences. Display survey results in pie graph. Organize sales data in a graph and use the graph to analyze the results of promotion techniques.
Create and post new advertising. Begin sales and sorting for distribution. Chart sales. Create promotion and analyze its effect on sales.	***Competent User*** Knows production is tied to demand and consumer taste. Believes price drives demand. Knows supply and demand often drive prices up or down.	***Visual Arts*** Use principles of proportion, composition, and perspective to design visually appealing advertising and AttaGram cards. Use appropriate tools (computers, copy machines) to produce AttaGram cards.
Prepare report to the stockholders. Perfect and polish the report using the performance rubric. Stage the stockholders meeting.	***Proficient Performer*** Knows production is tied to demand and customer taste. Knows companies frequently survey consumers to stay informed about changing taste and demand. Is well aware of the connection between supply and demand; knows that the time to buy is when there's "too much."	***Language Arts*** Use standard writing and speaking conventions to produce a stockholder report that exhibits a clear focus, sufficient elaboration and support, and overall coherence. Produce a document of reproduction quality using a computer or word processor.
Map connections to everyday-world companies and products. Analyze influences of marketing and product design on personal buying habits. Chart "sales helpers" from the all-class mind map.	***Expert*** Knows customer taste and interest change frequently. Is well aware that producers may keep supplies low to increase prices. Looks for sales, rebates, and quality of product. Researches major purchases before buying.	

Figure 12.2

Performance Rubric: A Special Holiday: AttaGram Day

Developmental Level Performance	Disastrous	Fumbling	Adequate	Proficient	Brilliant
Create Advertising Campaign	Uses a few, small posters very early in the process. Does not use the public address system (PA) for announcements. Other students don't get it: "What the heck is AttaGram Day?"	Makes a few, small posters. Makes no use of the PA. Other students don't get it: "What the heck is AttaGram Day?"	Makes a few small early posters. Makes a few PA announcements. "Oh, THAT'S what AttaGram Day is all about!"	Makes several small and large posters. Uses PA consistently. "Let's go buy some AttaGrams!"	Makes many large posters to educate and promote sales. Uses PA frequently. Creates effective special promotion. "Let's go buy some AttaGrams!"
Make Production Decisions	Throws together some designs, throws out the surveys. Makes the cards and just hopes they sell.	Throws together some designs, looks at the surveys. Makes the most popular card and hopes everyone will buy it.	Brainstorms ideas, then does card designs. Looks at the surveys. Makes the two most popular cards and pushes sales.	Brainstorms ideas, then does card designs. Looks at the surveys. Makes the top three cards and pushes sales.	Brainstorms ideas, then designs cards. Reviews surveys. Makes lots of the top three cards and a few of the others and pushes sales.
Plan Shipping Strategies	Creates a nightmare! Omits presorting. Stays up all night to sort cards. Makes lots of mistakes. Makes lots of angry customers.	Acts disorganized. Presorts envelopes in no particular order. Stays up late to sort delivery envelopes by homeroom. Makes some mistakes. Makes some angry customers.	Organizes early and well. Presorts envelopes in alphabetical order. Sorts delivery envelopes by homeroom. Makes a few minor mistakes. Makes a few happy customers.	Organizes early and well. Presorts envelopes in alphabetical order. Sorts and color-codes delivery envelopes by homeroom. Makes a few minor mistakes. Makes a few happy customers.	Organizes early and well. Presorts envelopes in alphabetical order. Sorts and color-codes delivery envelopes by homeroom. Makes no delivery mistakes. Has many happy customers.
Write Stockholder Report	Does not focus; is incoherent. Presents main points unclearly and/or without support. Has 5 or more spelling or punctuation errors. Has 5 or more handwritten corrections in document.	Has unclear focus; is inconsistent, rambles. Presents main points unclearly and/or without support. Has 3 or 4 spelling or punctuation errors. Has 3 or 4 handwritten corrections in document.	Shows clear focus. Presents main points clearly; provides some support. Has 1 or 2 spelling or punctuation errors. Has 1 or 2 handwritten corrections in document.	Shows clear focus. Presents main points clearly; provides some support. Has no spelling or punctuation errors. Produces reproduction-quality document.	Shows clear focus. Presents main points clearly; provides good support. Has no spelling or punctuation errors. Produces reproduction-quality document.
Present to Stockholders	Shows little evidence of preparation or rehearsal. Meets "boring" indicators on presentation rubric.	Acts scripted but not rehearsed. Knows topic, but not presentation skills.	Acts scripted and rehearsed. Acts stiff and stilted. Uses no spontaneity or humor. Meets "bland" indicators on presentation rubric.	Acts scripted and rehearsed. Adds some use of humor. Ad-libs with some reluctance. Mixes "bland" and "wow!" rubric indicators.	Acts scripted and rehearsed. Uses humor appropriately and effectively. Appears warm and engaging. A rubric "wow!"

Figure 12.3

BEST COPY AVAILABLE

AttaGram
For:
Way to GO!!!

day for the school, AttaGram Day. Each poster will announce the celebration date, provide a capsule summary of the purpose of the day, and direct students to wait and watch for further announcements.

Members of the marketing team will write short scripts for commercials announcing the day, and the students, with permission from the school administration, will use the public address system to make live announcements heralding the celebration.

Market Research

Each team will design and produce a prototype AttaGram. Teams may decide to use a variety of layouts for the cards: greeting card, postcard, newspaper headline, telegram, e-mail, membership card, credit card, or any other format that members of a team think would work well for an AttaGram. Each team will produce ten to twelve copies of its prototype card, and teams will exchange copies of their cards.

The teacher and students will prepare a simple market-survey tool to collect information about the sales potential for the different prototype cards. The survey could say, "Here are six proposed designs for the AttaGrams. Vote for the three that you like best and return this survey to the container just inside the door of room 312" (see fig. 12.4). The teacher will use school's photocopy equipment to reduce the prototype cards so that all six will fit on a single page. Students will distribute the survey forms to other classrooms and ask those teachers to encourage their students to complete and return the surveys.

As surveys are returned, members of the research team will tabulate the results and inform the class of the final rankings of the prototypes.

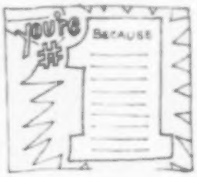
Production and Sales

After the research team has finished tabulating the survey results and reported the results to the rest of the class, students will discuss their production options. They may decide to limit the number of AttaGram designs they produce for sale. They may decide to produce all six designs, making a greater number of the more popular designs and fewer of the less popular ones. Or they may decide to make the same quantity of each of the six designs. The teacher will lead a discussion about which strategies students believe would be used by an everyday-world company. Students will agree that a company that wants to be successful will limit its inventory of cards with designs that a market survey shows to be less popular. Students will make their final production decisions and design new advertising posters (see fig. 12.5).

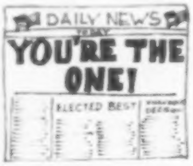
AttaGram
For:
Way to GO!!!

AttaGram Survey

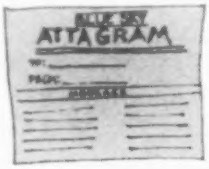
Here are six proposed designs for the AttaGram celebration cards. Vote for the three you like best and return this survey to the container just inside the door of room 312.


You're #1
Because

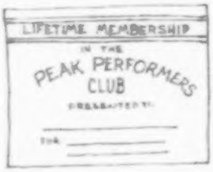
1


DAILY NEWS
TODAY
YOU'RE THE ONE!
ELECTED BEST

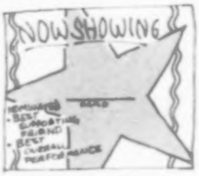
2


BLUE SKY
ATTAGRAM
TO:
FROM:
MESSAGE

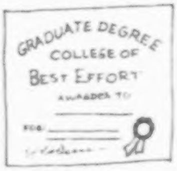
3


LIFETIME MEMBERSHIP
IN THE
PEAK PERFORMERS CLUB
PRESENTED TO
FOR

4


NOW SHOWING
BEST SUPPORTING FRIEND
BEST OVERALL PERFORMANCE

5

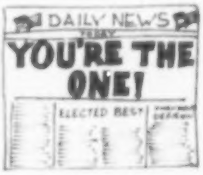

GRADUATE DEGREE
COLLEGE OF
BEST EFFORT
AWARDED TO
FOR

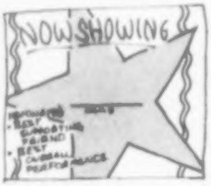
6

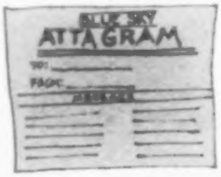
Figure 12.4

AttaGrams say . . .

"I'm your friend!"
"Thanks for the help!"
"Way to go!"
AttaGrams FOR SALE!
in these designs


DAILY NEWS
TODAY
YOU'RE THE ONE!
ELECTED BEST


NOW SHOWING
BEST SUPPORTING FRIEND
BEST OVERALL PERFORMANCE


BLUE SKY
ATTAGRAM
TO:
FROM:
MESSAGE

Pick yours out today:
cafeteria during lunch hours,
just 50 cents each while they last!

Figure 12.5

BEST COPY AVAILABLE

AttaGram
For:
Way to GO!!!

The teacher and the production team will arrange to have the AttaGrams printed, and teams from the company will take turns staffing the sales table during lunch periods. Salespeople will keep careful records of AttaGram sales, and, at the end of each day, the sales team will tally the number of cards sold and will enter the information in a ledger and on a sales-per-day graph (see fig. 12.6).

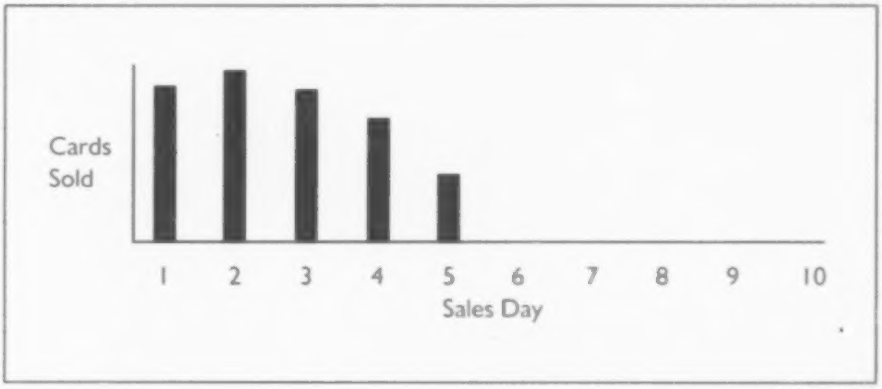


Figure 12.6

The sales team will use this graph during the final report to the stockholders to indicate trends of buyer activity.

Special Promotion and Distribution

As sales begin to drop off, the students will advertise a special, incentive, or promotion to increase AttaGram sales. The teacher will ask, "What kinds of incentives do everyday-world companies offer to encourage people to buy? How could you get some ideas about sales incentives or promotions used by everyday-world companies?" Students might suggest that they could watch television commercials or scan newspaper ads to collect a variety of ideas for stimulating sales. They will do the research, discuss the ideas, and make a final decision about the promotion they want to use. Students may decide to give a rebate with each sale—for example, buy an AttaGram and get twenty cents back. They may offer a gift, such as a pen, with the purchase of four or more AttaGrams. They may decide on a "buy one at full price, get one for half price" sale. Students will advertise the promotion, and the sales team will analyze the effect on sales of AttaGrams.

A few days before AttaGram Day, students will organize the greeting cards for delivery. At the end of each day of sales, students will sort and separate the AttaGrams they sold that day, putting all of the greeting cards that go to one recipient in a large envelope marked with that person's name. The shipping team will use information that the teacher obtained to sort these envelopes into delivery groups. For example, if the school uses homerooms, all of the card envelopes for recipients in a given homeroom will be grouped together. When the delivery groups of AttaGrams are organized, the shipping team will give each team in the class some of the delivery bundles.

AttaGram
For:
Way to GO!!!

On AttaGram Day, students will take the delivery bundles of addressed envelopes to classrooms throughout the school. Students from AttaGram, Inc. will hand deliver each envelope of AttaGrams to each recipient. If a recipient is absent, the teacher in the delivery classroom will keep the envelope to give to the student when he or she returns to school. The marketing team will write a special announcement celebrating friendship and appreciation that team members will deliver over the public address system. The announcement will encourage members of the school community to give each other extra encouragement and signs of celebration throughout the day. The marketing team may want to suggest that students and teachers give each other high-fives, thumbs-up signs, or other celebrations of friendship during AttaGram Day.

Report to the Stockholders

In the days that follow AttaGram Day, members of AttaGram, Inc. will prepare and deliver a report to the company stockholders. Members of other classes will play this role and will make up the audience for the presentation. The teacher will begin by asking, "What kinds of information do everyday-world companies give their stockholders? How can you get answers to this question?" Some students may suggest that family members receive booklets of information from their insurance, investment, or retirement plan companies, and offer to bring these booklets to class. The teacher may recommend websites that contain information that might be helpful in preparing these reports. Following are websites containing a variety of information about company performance and structure at the time of this printing.

- http://businessjournal.net/stories/090897/Sife.html
- http://www.abm.com/frames/annual/index.html
- http://www.cato.org/pubs/regulation/reg19n4f.html

Each of the company teams will prepare its own section of the stockholders report, make posters, charts, or transparencies to help in communicating the information, and prepare a copy-ready document. The teacher will arrange to have a large number of reports printed and available for members of the audience. Members of company teams will practice and polish their presentations in advance of the stockholders meeting.

The Presentation

On the day of the stockholders meeting, AttaGram, Inc. teams and the stockholders will assemble in the school auditorium. The teacher will make nec-

AttaGram
For
Way to GO!!!

essary arrangements for a microphone, a presentation easel, and an overhead projector. Students may have decided in advance that they would like to have the presentation videotaped, and the teacher will have contacted the audiovisual specialist and made the necessary arrangements for equipment and taping.

Each team will present its information about AttaGram Day to the stockholders. The management team will summarize the overall process, focusing on the effect of AttaGrams on the school's learning climate. The marketing team will describe how the class designed the advertising and decided on the special promotion. Members of the research team will focus on the survey to determine AttaGram design. Follow-up from the production team will focus on how the survey results determined which designs to use and how many cards of each design to produce. Using the sales-per-day graph, members of the sales team will discuss the overall trend in sales of AttaGrams and the effect of the special promotion on card sales. The shipping team will describe how cards were sorted and prepared for delivery to individual recipients. The management team will summarize the overall success of AttaGram, Inc. and provide the opportunity for audience members to ask questions. Finally, each team will summarize the main learnings of its members about the factors involved in creating a market for a new product.

The Reflection

Back in the classroom after the stockholders meeting, the teacher will say, "Let's tie what we've done to some everyday-world examples." The whole class will create a mind map for product success. Each team will contribute a section to the mind map in which the team names one product (or product line) that team members agree is a commercial success. For its product, the team members will describe the targeted market group, the advertising used to promote the product, the price range, the nonprice factors that seem to influence demand for the product, and the methods used by the producer to promote sales or manipulate the market. Each team will design and produce its section of the mind map on a sheet of paper that measures approximately fifteen square inches. The teacher will create a graphic, How Businesses Succeed, and tape it on the wall of the classroom. The student teams will tape their sections of the mind map around this core graphic.

When the mind map is assembled, the students and teacher will examine the separate sections and then look for common threads. They may agree that price range is not necessarily a predictor of success but that target groups and marketing strategies seem to play a crucial role in commercial success or failure. The teacher and students may use a chart to summarize their findings (see fig. 12.7).

Commercial Success Helpers

Target Group	Advertising Tactics	Promotions	Other

Figure 12.7

AttaGram
For
Way to GO!!!

The class then will reflect on the overall performance learning process using de Bono's PMI (1976).

Finally, each student will write him- or herself a personal telegram. The whole-class and personal reflections will help students and teacher tie this task to everyday-world practices that they encounter every day and may help them to be more thoughtful, independent consumers.

Reflection

WHOLE-CLASS REFLECTION

AttaGram, Inc. Experience

Pluses	Minuses	Interestings

INDIVIDUAL REFLECTION

Personal Telegram

To:

Date: ten years from now

Topic: Commerical Success

When I start marketing my own new product, I want to remember:

- Marketing strategies
- Nonprice influences
- Business principles
- Personal principles

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There are
one-story intellects,
two-story intellects, and three-story
intellects with skylights. All fact collectors, who
have no aim beyond their facts, are one-story men. Two-story men
compare, reason, generalize, using the labors of the fact collectors as
well as their own. Three-story men idealize, imagine,
predict—their best illumination comes from
above, through the skylight.
—*Oliver Wendell*
Holmes

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Sally specializes in teaching educators how to use practical strategies that expand student teamwork, cognition, metacognition, strategic planning, and self-evaluation skills. She developed and tested many of her ideas during her 30 years of teaching science in a large Chicago-area high school. Sally is a SkyLight consultant and has written five other books: *Catch Them Thinking in Science, A Multiple Intelligences Road to a Quality Classroom, Making Choice Theory Work in a Quality Classroom, Project Learning for the Multiple Intelligences Classroom,* and *Service Learning for the Multiple Intelligences Classroom.*

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